

July 1959

Tie ejector-liner for track plow

p. 21

ilway **TRACK** and

# STRUCTURES

The jointed aerial boom

Cost-saving tool for B&B forces

p. 28



A Simmons-Boardman TIME-SAVER Publication



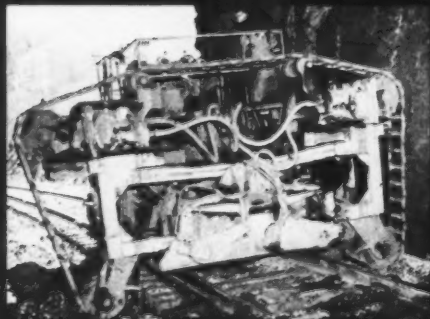
*Kershaw*

## UNDERCUTTER & LOADER

*... Cleans tunnels on the  
Clinchfield*



The Undercutter removed the ballast from beneath the track and the ballast was then loaded by the Ballast Loader and Conveyor into dump cars.



Cost of undercutting and lowering the track, removing the old, cemented foul ballast from the tunnel? Only \$5.07 per cubic yard!

The Kershaw Track Undercutter and its sister machine, the Ballast Loader and Conveyor, recently set an enviable production record while on the Clinchfield Railroad. Undercutting track from 4½" to 6½" each pass, track was lowered as much as 31" under extremely difficult working conditions.

If you have a tunnel cleaning or other track lowering problems, contact your nearest Kershaw representative, or write.

**KERSHAW**  
MANUFACTURING CO. INC.

MONTGOMERY



ALABAMA



## Heat-treated Rails Star on the Lackawanna

Here is one of many formidable curves on the "Route of Phoebe Snow" through Pennsylvania's Pocono Mountains. At this point, the curve is 8 degrees 30 minutes, the grade about 1.6 pct, and the super-elevation is  $6\frac{1}{2}$  in. Length of curve is approximately 3000 ft. Quite an ordeal for the rails when a heavy drag thunders through!

With this in mind, the Lackawanna in 1953 laid standard control-cooled rails on the westbound track (right), and Bethlehem heat-treated

control-cooled rails on both high and low sides of the eastbound track.

When the above photograph was taken last November, one of the railroad's engineers observed that the standard rails would have to be replaced this Spring, while the heat-treated rails looked good for several more years of service. Even allowing for the higher initial cost of heat-treated rails, the Lackawanna thus stands to realize a substantial saving at this installation.

Not surprising to us at Bethlehem,

of course. We have been in on quite a number of similar cases on major railroads across the land. We see a shining future for heat-treated rails, and for the roads that use them. We shall welcome the opportunity to look into this future with you. Just get in touch with our nearest office, or drop us a line at the address below.

**BETHLEHEM STEEL COMPANY**  
BETHLEHEM PA.

*Export Distributor: Bethlehem Steel Export Corporation*

# BETHLEHEM STEEL



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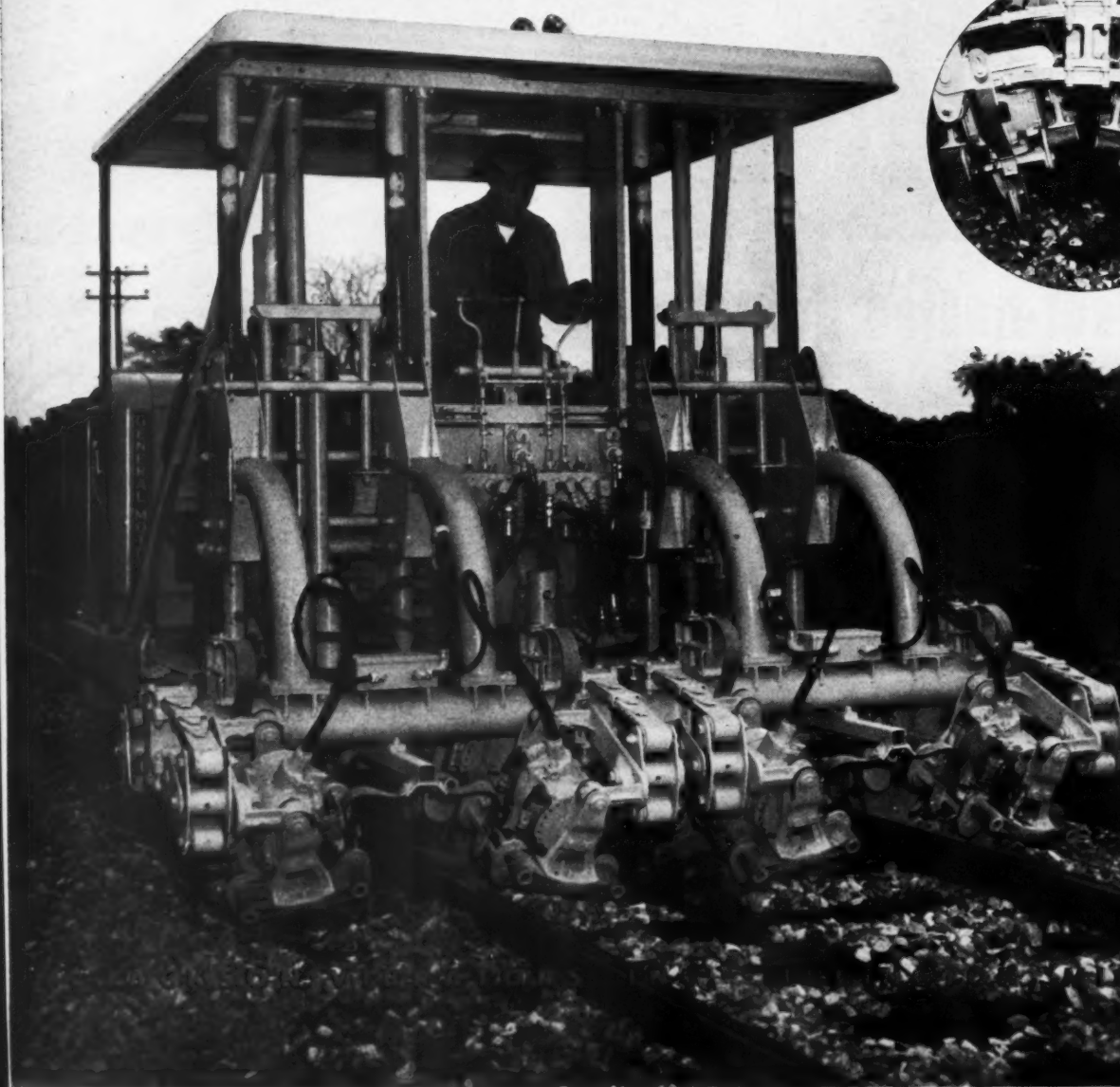
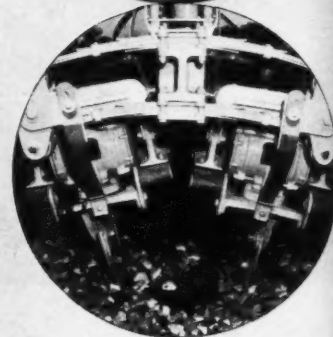
# THE JACKSON TRACK MAINTAINER

*does a Marvelous Job!*

Which accounts for the fact that there are more of these machines in daily use than all other tampers in its category combined.

Write, wire or phone for details of construction and operation which constitute the basic reasons why this machine offers unrivalled opportunity for both constructing and maintaining track of finest quality at the lowest possible cost per mile.

In Cemented  
Ballast— Largest  
Rock or Anything  
in Between—



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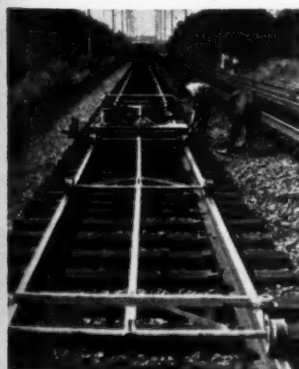
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RAILWAY TRACK and STRUCTURES

**Tie ejector-liner for undertrack plow** ..... 21  
New machine saves the labor formerly required to remove old ties and line track behind the plow.

**Tie tester uses atomic rays** ..... 24  
New York Central Research Center has come up with a portable device that employs low-level gamma rays to measure wood density.

**More tests with asphalt-coated ballast** ..... 25  
New series of service tests is aimed primarily at determining economy of asphalt ballast on track with fewer rail joints.

**The jointed aerial boom—Tool for the B&B forces** ..... 28  
Because it eliminates the need for scaffolding this device is building a record for itself as a cost-saver on a multitude of jobs.

**How the SP crops rails in track** ..... 32  
Using a mechanized organization built around power hack saws this road is field-cropping rail at a cost of \$13.00 per joint.

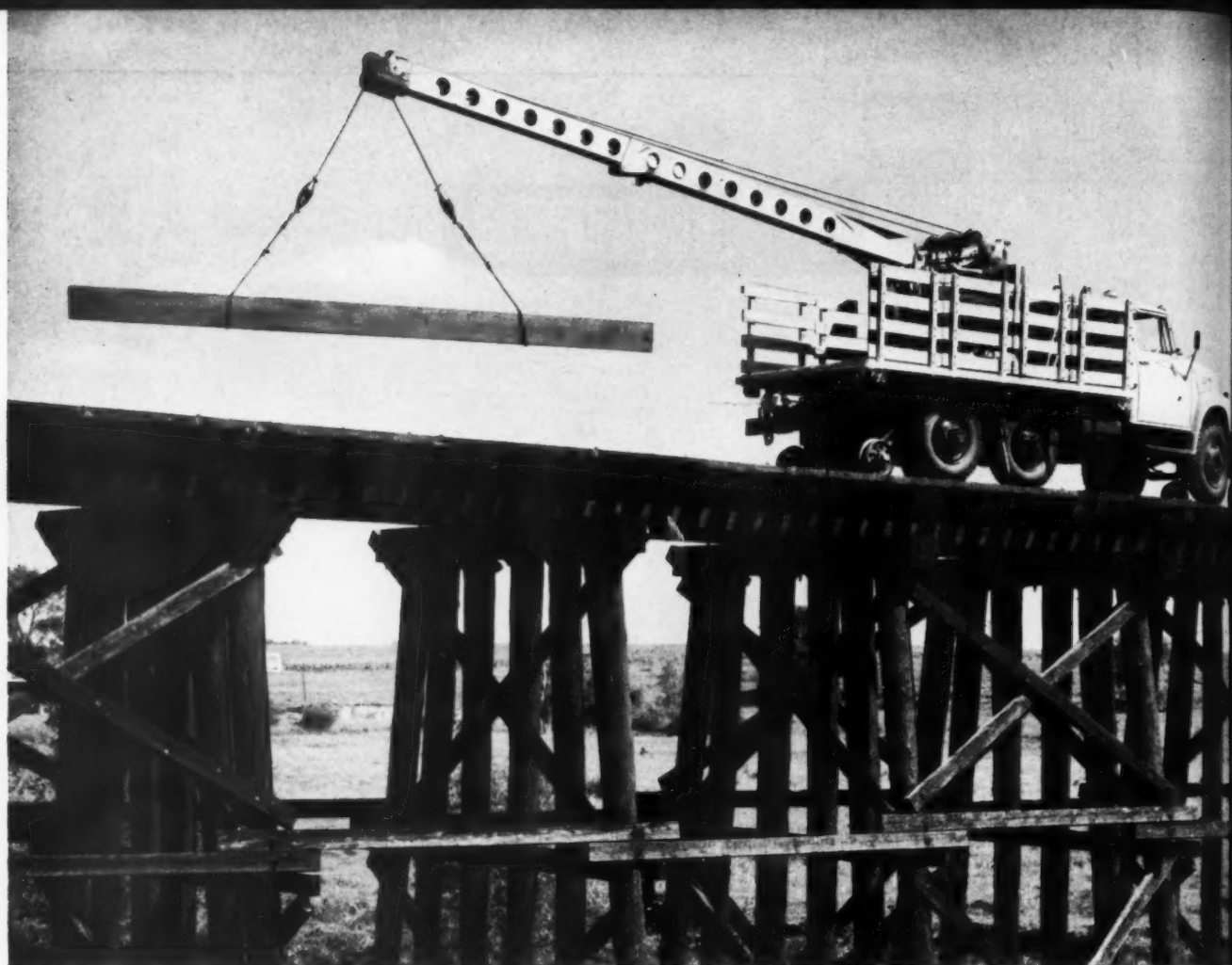
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## ◀ Don't miss . . .

New "midget" wire device detects imperfections in track surface and cross level. It's designed for use in spotting track or for working behind tamping jacks in out-of-face surfacing operations.

**. . . in the August issue**



# FAIRMONT

## Hydraulic equipment speeds trestle maintenance

Equip your bridge gangs with an A40 Series A Hy-Rail and hydraulically powered Bridge Tools, and trestle maintenance work will go faster than ever before! This track-and-highway mobile unit mounts a full hydraulic crane with telescoping boom. With the unit's remote vehicle engine controls, one man can operate the crane while moving the truck along the trestle. Hydraulic operation permits 360 degree continuous boom rotation, boom extension or retraction, changing of boom angle and load handling with twin cable lines. The use of two lines, each with 1200 lb. capacity, eliminates the

need to find load balance point, and loads can easily be leveled or tilted. This fast-moving vehicle operates equally well on track or highway. It helps your crew to work swiftly and safely. There's a complete assortment of hydraulic hand tools for use with this unit. They can operate more than 100 feet from the power source, and put quiet hydraulic power to work cutting and pulling bolts, drilling, cutting piles underwater, etc. Write today for complete information on the advantages of the Fairmont A40 Series A Hy-Rail and Hydraulic Bridge Tools.

HYDRAULIC CHAIN SAW works underwater without modification, 20" and 30" models available.



HYDRAULIC BOLT CUTTER can shear mild steel bolts up to 3/4" diameter.

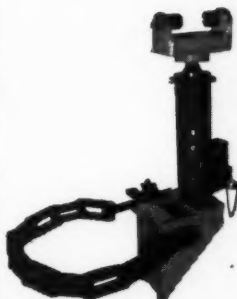


IMPACT WRENCH AND DRILL are hydraulically powered. Wrench is reversible.





HYDRAULIC BOLT PULLER makes it easy to pull drift bolts in open deck trestles, 24" stroke.



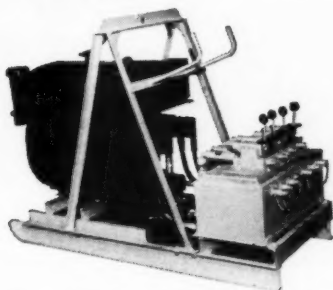
HYDRAULIC JACK clamps onto pile and pushes against jack beam or cap, 22 ton capacity.



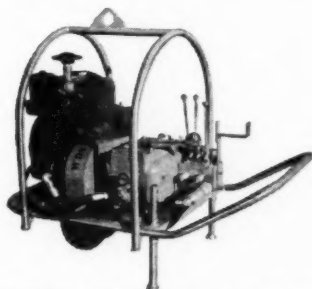
JACK BEAM is placed below stringers, jacks push against it when renewing caps.



BRIDGE SCAFFOLD has anti-skid walkway and adjustable support chains.



W103 MULTIPLE PUMP POWER UNIT has four pumps and control valves, can operate four different tools at same time.



W98 POWER UNIT includes one pump and three control valves, delivers oil at two different pressures, works one tool at a time.

## Helps from Manufacturers

The following compilation of literature—including pamphlets and data sheets—is offered free to railroad men by manufacturers to the railroad industry. To receive the desired information, write direct to the manufacturer.

**TRUCK CRANE.** The Bantam Model T-350, 11-ton, carrier-mounted crane-excavator is described and illustrated in a new bulletin. The 12-page, 2-color bulletin, T-350, explains the standard and optional features of the machine and its application in 16 different markets, such as railroads, excavating, steel erection and materials handling. The complete line of crane-carriers is also described. Front-end attachments which are available for use with the T-350 are covered in the bulletin, including the backhoe, shovel, dragline, tamper, pile driver, clamshell, concrete bucket, magnet crane and grapple. (Write: *Schild Bantam Company, Dept. RTS, Waverly, Iowa*)

**PIPE WELDING.** A new booklet, Form ADR 118, is available, which includes two technical articles on the welding of small pipe. The articles were written by A. N. Kugler, chief welding engineer of the Air Reduction Sales Company. The first article defines and describes the welding processes applicable to the joining of small pipe. It also covers applied welding engineering, fields of application and welding equipment. The second article covers the principles of welding and brazing design and how they can be applied to the various pipe metals. (Write: *Air Reduction Sales Company, Division of Air Reduction Company, Inc., Dept. RTS, 150 East 42nd St., New York 17, N.Y.*)

**EARTHMOVING EQUIPMENT.** The features and advantages of the new Caterpillar 933 Series F Traxcavator are described and illustrated in a 6-page pamphlet now available. The 2-color pamphlet, Form 33286, points out the improvements of the new machine over its predecessor, the Series E. A cutaway drawing shows the improvements that have been made to the final drives. The new D311 engine is also pictured and shown in cross-section. Brief specifications of the No. 933 Series F are included. Also described are the attachments that are available for use with the Traxcavator. (Write: *Caterpillar Tractor Company, Advertising Division, Dept. RTS, Peoria, Ill.*)

**GRATINGS AND TREADS.** The advantages of using open flooring for industrial applications are described in a 24-page booklet now available. Various types of applications of electro-forged and other types of gratings are described or illustrated. Information presented in the booklet includes types of gratings, spacing, bearing bar surfaces, weights and methods of fastening. Safe loads for electroforged carbon steel and aluminum interlock gratings are also given. Stair treads are described and illustrated. (Write: *Blaw-Knox Company, Grating Department, Dept. RTS, Blawnox P.O. Box 1198, Pittsburgh 30, Pa.*)

**NON-SHRINK MORTAR.** The use of Embeco non-shrink mortar for repairing the joints in worn or corroded brick and tile floors is covered in a bulletin now available. Bulletin E-37A explains and illustrates each step in the use of the material for producing tight joints in these types of floors. (Write: *The Master Builders Company, Dept. RTS, Cleveland 3, Ohio*)

**TRACTOR EQUIPMENT.** Construction equipment that is engineered for use with Caterpillar tractors is featured in a folder now available. The advantages and features of compaction machines, excavator cranes, winches, and hydraulic backhoes are described and illustrated. Photographs show the equipment in use on various jobs. (Write: *Hyster Company, Tractor Equipment Division, Dept. RTS, Peoria, Ill.*)

**ADJUSTABLE RAMPS.** A comprehensive 8-page brochure is available, which describes the company's complete line of powered adjustable ramps for loading docks. The brochure contains detailed information, photographs and complete specifications on three models of the Adjust-A-Dock and the Adjust-A-Truck leveling devices. Also covered is a description of the factors which need to be considered when selecting a leveling device to meet varying operating requirements. (Write: *Rowe Methods, Inc., Dept. RTS, 2534 Detroit Ave., Cleveland 13, Ohio*)

**Fairmont**  
RAILWAY MOTORS, INCORPORATED  
FAIRMONT, MINNESOTA



# NEW RTW ONE-MAN TRACK GRINDERS

## Are All-Electric . . . Portable . . . Heavy Duty

Balanced design means just one man mounts, moves and operates these new precision, lightweight, all-electric grinders with minimum effort and expense



**Model X-61-E**

Portable Electric Cross  
Grinder or Slotter

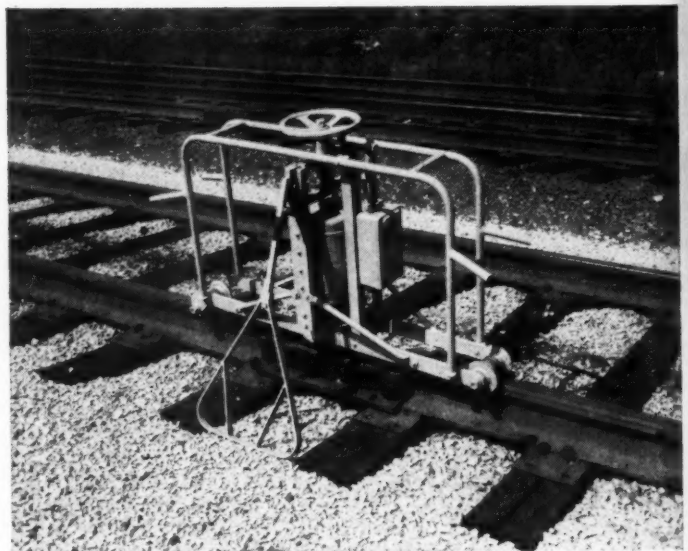
Designed for use with welding generator sets, the X-61-E is easily maneuverable, ruggedly constructed to insure precision operation with little vibration over a long service life. The entire unit weighs only 195 pounds, rolls over and off the track quickly and easily as the operator takes hold of the protective cage.

Standard equipment includes 1½hp, 220/440 heavy duty motor and starter box. 8" d., ⅝" bore grinding wheels available in various thicknesses. Overall dimensions . . . Height: 24" . . . Width: 21" (along axis of track as mounted for operation) . . . Length: 33" (exclusive of outrigger).

**Model P-62-E**

Portable Electric Rail End  
or Surface Grinder

The simple, balanced design of the Model P-62-E keeps maintenance to a minimum, means additional savings in operating costs, reduces operator fatigue. Standard equipment on the new, improved Rail End or Surface Grinder includes a rugged, all-weather 5hp electric motor and starter box and one 8" x 2" cup grinding wheel. Overall dimensions . . . Height: 25½" . . . Width: 14½" . . . Length: 58" . . . Total Weight . . . only 275 pounds.



For more information on either or both of these labor-saving, cost-cutting, one-man track grinders, write today.

## Railway Trackwork Co.


3207 Kensington Ave., Philadelphia 34, Pa.

**Agents:** Spokane—Franco Bryan Inc. • Louisville—T. F. Going • Norfolk—Robert L. Nutt, Jr. • Omaha—Roth Railway Supply  
• St. Louis—Clarence Gush • Chicago—D. J. Hogan & Co. • San Antonio—H. W. Lewis Equip. Co.  
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### TRACK MAINTENANCE MACHINERY

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Drills • Cross Cutters • Bit Sharpeners • Tie Nippers  
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**FOR SMALL, HIGH SPEED ENGINES**



# **NEW AND IMPROVED ESSOLUBE<sup>®</sup> HDX**

## **KEEPS MOVING PARTS CLEAN**

New Essolube HDX clings to bearing surfaces with a tough lubricating film that helps prevent wear and resists metal scoring under heaviest load conditions. From top to bottom, Essolube HDX keeps engines clean, keeps all moving parts free from carbon and varnish deposits.

When tested and compared (with a reference heavy-duty oil of higher than average quality) over one million miles of field tests proved Essolube HDX gave better lubrication in these vital areas:

- Bearings showed less wear from oil film breakdowns, and less corrosion from combustion by-products.
- Piston varnish deposits were greatly reduced, rings stayed clean and free acting — extending engine life.
- Anti-wear additive gave greater protection to cam shafts, valve lifters, bearings and gears.

Essolube HDX is another new product developed by Esso Research to reduce railroad maintenance costs. Specify Essolube HDX for maintenance-of-way and other equipment using small, high-speed engines. For more information, write: Esso Standard Oil Company, Railroad Sales Division, 15 West 51 St., New York 19, N.Y.



**RAILROAD PRODUCTS**

**In Industry after Industry... "ESSO RESEARCH works wonders with oil"**

**CANADIAN NATIONAL** — John H. Spicer, chief budget officer at Montreal, Que., has been promoted to chief of engineering economics. **Murray G. Cusack**, roadmaster at Fredericton, N. B., has retired after 40 years of service.

**CANADIAN PACIFIC** — The following appointments have been made at Toronto, Ont., recently: **J. R. Nutter** as division engineer of the Terminals division, and **J. H. Fleff** as acting division engineer of the Bruce division.

**CHESAPEAKE & OHIO**—**W. M. Dowdy**, assistant division engineer at Columbus, Ohio, has been promoted to division engineer at Clifton Forge, Va., succeeding **H. B. Orr** who has been advanced to assistant chief engineer at Detroit, Mich. Mr. Orr succeeds **C. B. Porter** who has been appointed assistant general real estate agent at Huntington, W. Va.

**L. H. Cook**, assistant supervisor track at Hinton, W. Va., has been promoted to supervisor track at Newport News, Va., succeeding **A. W. Dudley, Jr.**, promoted to assistant trainmaster at Gauley, W. Va. **E. L. Corker** has been appointed assistant supervisor track at Hinton.

**B. F. Houser**, assistant cost engineer, has been promoted to supervisor track at Maysville, Ky., succeeding **L. E. Williams**, deceased. **Harold Veldheer**, carpenter foreman, has been promoted to assistant bridge and building supervisor at Grand Rapids, Mich.

**CLINCHFIELD**—**E. J. Swofford**, track supervisor at Marion, N. C., has been promoted to roadmaster at Erwin, Tenn., succeeding **H. A. Brown** who has retired after more than 50 years of service. The following appointments have also been made recently: **B. C. Roberts** as supervisor at Marion; **W. G. Swofford** as assistant supervisor at Marion; and **R. H. Wilson** as assistant engineer at Erwin.

**DULUTH, MISSABE & IRON RANGE**—**Robert B. Rhode**, assistant chief engineer at Duluth, Mich., has been promoted to chief engineer there, succeeding **Harry A. Smith** who has retired after more than 40 years of service with the road.

**ILLINOIS CENTRAL**—**J. E. Rogan**, division engineer, and **J. S. Murphey**, assistant to division engineer, both with headquarters at Jackson, Miss., have been transferred to New Orleans, La. This is the result of a reorganization of divisions.

**LAKE SUPERIOR & ISHPEMING**—**Robley H. Morrison**, chief engineer at Marquette, Mich., has been elected vice president and chief engineer.

**MILWAUKEE**—**K. J. Anderson**, extra gang foreman and section foreman on the Hastings and Dakota division, has been promoted to roadmaster at Lewistown, Mont., succeeding **A. M. Olson** who has been advanced to assistant general roadmaster at Chicago.

**NEW YORK CENTRAL**—**Jay M. Gilmore**, division engineer at Indianapolis, Ind., has been promoted to methods engineer — bridges and buildings at New York. **Robert T. Fortin**, assistant division engineer at Indianapolis, Ind., has been promoted to division engineer there. **Robert J. Klueh**, district engineer of structures at New York, has been promoted to assistant division engineer at Indianapolis. **E. F. Gifford**, assistant structures engineer at New York, has retired after 42 years of service.

**NORTH WESTERN**—**M. W. Westphal**, assistant roadmaster at Milwaukee, Wis., has been promoted to roadmaster at Norfolk, Neb., succeeding **J. P. Fedele** who has been transferred to Waukegan, Ill. Mr. Fedele succeeds **J. P. Hanges** whose transfer to Iron Mountain, Mich., was announced in the June issue.

**PENNSYLVANIA** — The following appointments have been made recently: **H. T. Johnson** as assistant supervisor structures at New York; **F. J. O'Keefe** as assistant supervisor structures at Buffalo, N. Y.; **D. C. Snyder** as assistant supervisor track at Johnstown, Pa.; **J. Stillson** as general foreman structures at Johnstown, Pa.; **M. A. Ferguson** as supervisor track at Grand Rapids, Mich.; **H. M. Shoaf** as supervisor track at Lancaster, Ohio; **E. H. Steel, Jr.**, as supervisor track at Morrow, Ohio.

**READING**—**Kingsley W. Ebert**, assistant resident engineer at Philadelphia, Pa., has been promoted to resident engineer there, succeeding **W. H. Eckenbrine** who retired on May 31. **Robert W. Wyatt** has been appointed assistant resident engineer.

**TEXAS & PACIFIC**—**Ernest C. Ponder**, assistant engineer at Alexandria, La., has been promoted to assistant engineer, bridge department, at Dallas, Tex.

## Obituary

**R. G. May**, 55, vice president in charge of the Operations and Maintenance department of the Association of American Railroads, died on June 2.

**W. H. Penfield**, retired chief engineer of the Milwaukee Road, died in a hospital at Savanna, Ill., on June 1 at the age of 85. Mr. Penfield entered the service of the Milwaukee in 1899 and served in various capacities until 1913 when he was promoted to engineer maintenance of way. He was advanced to chief engineer in May 1935, which position he held until he retired on November 15, 1945.

**A. T. Powell**, 65, retired assistant chief engineer of the Grand Trunk Western at Detroit, Mich., died recently.

**Frank H. McKenney**, engineer of track of the Burlington at Chicago, died on May 23.

**Thomas V. Pyle**, engineer of design of the Elgin, Joliet & Eastern at Joliet, Ill., died on April 14.

**R. P. Cox**, assistant engineer of buildings of the Burlington at Chicago, died May 28 at his home in Brookfield, Ill., at the age of 56.

**Harry W. Bell**, assistant division engineer on the Louisville & Nashville at Ravenna, Ky., died suddenly on April 11.

**W. McCoy**, retired roadmaster on the Cotton Belt at Dallas, Tex., died on May 22 at the age of 59.

**R. W. Laskey**, 66, retired assistant engineer on the Canadian National at Fredericton, N. B., died recently.

## Biographical Briefs

**James B. Clark**, 45, who was recently promoted to chief engineer of the Louisville & Nashville at Louisville, Ky. (*RT&S*, May, p. 10), was born at Sweetwater, Tenn., and graduated from the University of Tennessee in 1937 with a Bachelor of Science degree in civil engineering. He entered the service of the Louisville & Nashville in 1937 as a draftsman at Louisville, advancing to assistant engineer at Birmingham, Ala., in 1942. Mr. Clark was transferred to Louisville the following year and in January 1945 was promoted to assistant supervisor bridges and buildings at Birmingham. Five months later he was further promoted to assistant division engineer at the same location. In May 1947 he was advanced to division engineer at Latonia, Ky., and transferred to Birmingham two months later. Mr. Clark was promoted to assistant to general manager at Louisville in 1950, to superintendent there in 1952 and to assistant director of personnel, also at Louisville, in 1955, the position he held at the time of his recent promotion.

**Howard C. Forman**, 63, who was recently promoted to assistant general manager of the Louisville & Nashville at Louisville, Ky. (*RT&S*, May, p. 10), was born in Owen county, Ky., and graduated from the University of Kentucky in 1920 with a Bachelor of Science degree in civil engineering.

(Continued on page 58)



**James B. Clark**  
L & N



**H. C. Forman**  
L & N



# now it's easier to Destroy Weeds...

*with ready-to-use, easy-to-apply*

EFFECTIVE...ECONOMICAL

## UREABOR®

WEED and GRASS KILLER



Here's your thriftier, easier way to stop weeds! Look in that hand and you'll see enough UREABOR to kill vegetation in a 12 sq. ft. area! Consider the convenience and economy this can mean to you.

Consider, too, that a UREABOR "kill" remains effective for a season or longer. And UREABOR has important safety features; it is *nonflammable*, *nonpoisonous* when used as directed, and *does not corrode* ferrous metals. Protect your timber structures, yards and buildings from fire-hazardous weeds by applying UREABOR weed killer now...it's easier to apply!

Write today  
for complete  
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PACIFIC COAST BORAX COMPANY DIVISION

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Nothing to mix...no water to haul  
*One easy application—dry—may keep ground weed-free for a season or longer!*

This special spreader for UREABOR makes application fast and easy...

The PCB Spreader applies UREABOR to best advantage, at prescribed low rates. It holds enough UREABOR to treat up to 2500 sq. ft. without refilling—weighs a mere 6 lbs.





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exclusive **T-POWER** construction  
stops track creepage  
with up to 5 times more  
bearing area

Two full length bearing  
surfaces give greater  
resistance to movement.

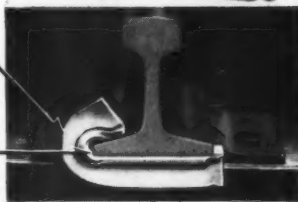
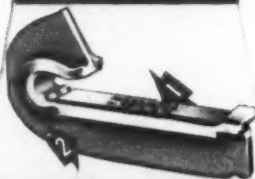
1. Complete length of T  
section rib bears against  
tie plate — fits perfectly  
between rail and tie.

2. Stem of T section  
bears against tie —  
Inside angle between  
rib and stem is rounded  
to compress tie fiber;  
prevents cutting of tie.

STRIKING FACE provides  
a perfect target for fast,  
accurate application . . .

OVERDRIVE STOP assures  
proper application —  
everytime. Custom  
manufactured to fit all  
types of rail regardless  
of condition.

\* Trademark



Holding the rail in a vise-like grip, the  
**IMPROVED FAIR** rail anchor bears against  
the tie, tie plate or both. When the stresses  
of traffic or thermal changes occur,  
**T-POWER** stops track creeping cold. Up to 11  
square inches of bearing area help to  
do the job better—Result: Holding power is  
increased; tie life is extended; maintenance  
costs are reduced. And, **IMPROVED FAIR**  
rail anchors can be applied with maul, sledge  
or by machine...Get the complete **T-POWER**  
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ST. PAUL • WASHINGTON • SAN FRANCISCO • MEXICO CITY

. . . a résumé of current events throughout the railroad world

The Railway Express Agency is faced with several developments that may have a bearing on its future status. One is proposed legislation, embodied in Senate Bill 1306, that would increase the size and weight limits of parcel post packages. The legislation, if passed, will put the agency out of business, according to William B. Johnson, president. This view is confirmed by G. M. Harrison, president of the Brotherhood of Railway Clerks, who stated that enactment of the bill would force the 35,000 employees of the agency into unemployment.

The other development is a move to have the Railway Express Agency incorporated in the post office. Hearings on a resolution to this effect got under way on June 22.

A proposal by the railroads that President Eisenhower appoint a special commission to study working rules and conditions on the railroads has been rejected by the operating brotherhoods. The rejection came in a letter to AAR president Daniel P. Loomis, which was signed by the heads of five unions. Commenting on the proposed study, H. E. Gilbert, president of the Brotherhood of Locomotive Firemen and Enginemen, charged the carriers are conducting a "multi-million dollar character-assassination program to vilify the respected name of railroad labor."

Eleven unions representing non-operating railroad employees have served demands for longer paid vacations and two more paid holidays per year. It was indicated the unions are still giving consideration to the demands they will serve for wage increases and changes in working rules. Their vacations demand: Two weeks, instead of 1, after one year of service; 3 weeks, instead of 2, after 5 years of service; and 4 weeks after 10 years of service, instead of 3 weeks after 15 years. The two additional paid holidays demanded are Good Friday and Veterans' Day.

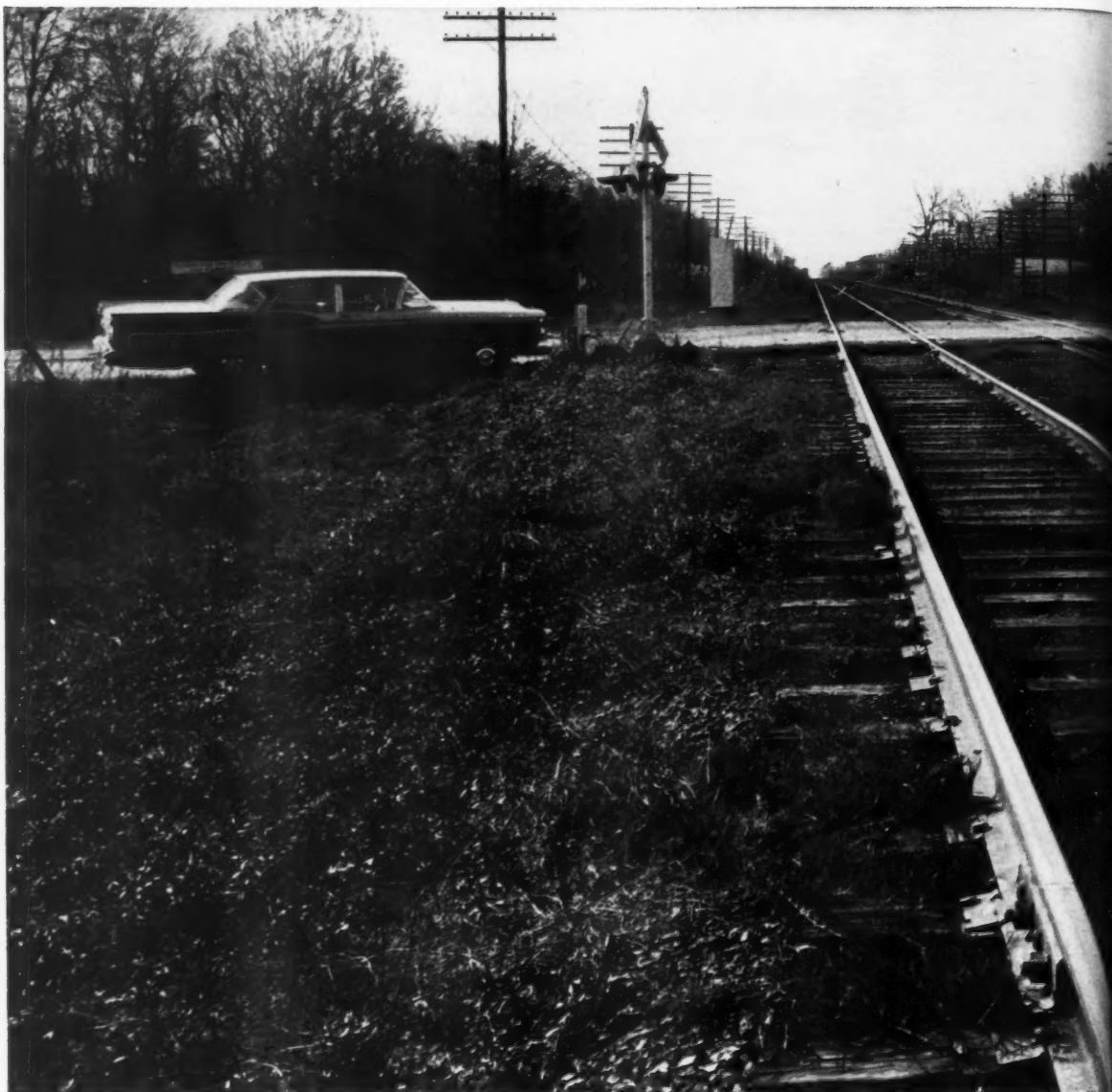
Expenditures of the railways for new plant and equipment are expected to amount to \$867 million in 1959, an increase of 15 per cent compared with 1958, according to the Department of Commerce and the Securities and Exchange Commission. The third-quarter expenditure rate is expected to be almost twice that of the final quarter of 1958.

In the first four months of 1959, the Class I railroads had a net income of approximately \$161.5 million compared with \$48 million in the first four months of 1958 and \$224 million in the first four months of 1957, according to figures compiled by the Association of American Railroads. In April these roads had a net income of approximately \$62 million as against \$17 million in April 1958 and \$61 million in April 1957. In the 12-month period ended April 30, 1959, the rate of return on railroad property investment (after depreciation) was 3.18 per cent, according to the AAR.





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RAILWAY TRACK and STRUCTURES

JULY, 1959 15

### Tests are successful, but . . .

The fact that a new series of tests of asphalt-coated ballast is being undertaken this year (p. 25) raises an interesting line of thought.

There have been several previous tests of such ballast, going back as far as 1926. Even though the reports on observations of these installations were favorable the railroads on which they were located never followed through by making further test installations or by adopting asphalt-coated ballast for regular use.

This is a phenomenon that has occurred before. Even though test results are satisfactory there is apparently a complete loss of interest, at least for a time.

What happened with continuous welded rail affords an example of this phenomenon. The road that was most aggressive in making test installations, and had the greatest mileage of such rail, made periodic reports indicating that substantial savings in maintenance costs were being experienced. Yet for many years it made no further installations of such rail, even while other roads were adopting it as standard practice.

Quite probably any attempt to find a categorical explanation for this state of affairs would be fruitless. There are too many possible answers. Perhaps the element of caution plays an important part. Perhaps there is a loss of interest when the original sponsor of the tests passes from the scene. Or it could be that subsequent observations or analysis revealed that the earlier conclusions were overly optimistic.

In any event there's a lesson to be learned here, and that is that test results can't be evaluated too carefully before reaching a conclusion, one way or the other.

## The conference as a means of communication

Railroads are benefiting these days from wider use of the conference method of handling problems involving people.

This method, which is nothing more or less than a group of people sitting down together to discuss matters of mutual interest, has long been used in the railroad field, as in industry generally, by top officers and department heads as an instrument for reaching managerial decisions and handling policy matters. The conference thus came to be regarded as a method whose usefulness was limited to the discussion of secret or semi-secret matters of a top-level nature. Looking back from this point it is apparent that industry generally, and the railroads in particular, were overlooking a potentially valuable means of communication with supervisors and employees.

To some extent this oversight has now been corrected. For quite a few years now it has been common practice for some roads to bring their supervisory employees together periodically to acquaint them with new policies and other developments having a bearing on their performance as representatives of management. These conferences have come to be highly regarded by management for two reasons: (1) They serve as excellent briefing sessions; and (2) they help to assure the loyalty and cooperation of the supervisory forces.

As one management representative put it: "When you bring a roadmaster in and put him up at one of the best hotels in town for several days, take him to the finest restaurants and give him an opportunity to express his views during discussion periods, he's bound to go home feeling that he is playing an important role in the overall picture."

With the value of the conference technique established by these earlier experiences the railroads have been extending and broadening its use in recent years. As a matter of fact it has become almost indispensable in these days of rapid and far-reaching changes in the maintenance of way and structures field. If the best results are to be realized from these changes they must be explained to the supervisors who are to put them into effect, and perhaps even to some of the other employees who will be affected by them. The conference is proving to be an excellent medium for making these explanations.

For example, when the B&O revamped its M/W organization on a system-wide basis (*RT&S*, June, p. 21) and negotiated a new agreement with the union covering the changes, it held a series of conferences for the purpose of explaining the new setup to the foremen and men. Another large road held a similar series of conferences for the same reason. When the Santa Fe ran into a number of particularly vexing problems in the bridge and building field it found that a systemwide B&B conference (*RT&S*, May, p. 30) was helpful in solving them.

The conference is now a proven means of dealing with organizational problems and of establishing better communications with supervisory and other employees. It deserves even wider application for this purpose. Those supervisors, and even foremen, who wish to establish better relationships with the men under them should, in particular, give serious consideration to broadening their own use of the conference technique.



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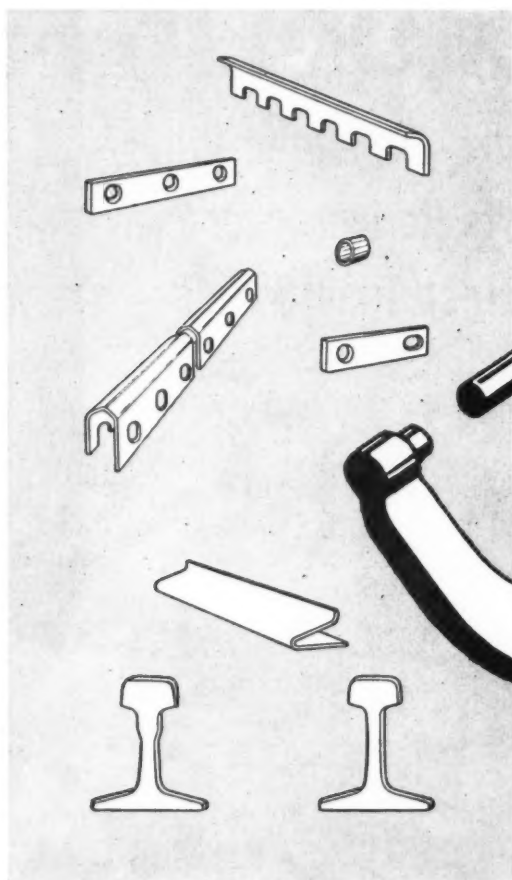


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## Tie ejector-liner for undertrack plow

Up to now the work of taking out old ties when using the undertrack plow has been done by hand and has required considerable manpower. The same is true for the track-lining operation required immediately behind the plow. Both operations have now been mechanized by a new machine that's attached directly to the plow.

**WORKING** with the plow is this newest Mannix machine which knocks ties to be renewed from the rails and ejects them. It also lines the track behind the plow while the track is held above the subgrade.

as controls for governing the various functions. All movements and adjustments are actuated hydraulically by power furnished by a 56-hp V-4 Wisconsin engine.

When in operation the tie ejector-liner is attached at the front end to an undertrack plow or sled which is pulled ahead by a work train in the usual manner. If desired, the unit may be detached and used solely as a track-lining machine, in which case it is operated under its own power.

### How it lines track

The trusses provide the length and rigidity required by the track-lining feature of the unit. When lining track the machine makes use of three separate pressure points—the front and rear trucks and a liner head mounted between them near the middle of the main frame. By applying side pressure, either to the front truck or to the liner head, the skeletonized track is easily lined before it settles on the smoothed roadbed.

A heavy upright yoke, to which the head truck is pivoted, is used to anchor the head end of the lining machine to supports at the forward end of the plow or sled. A hydraulic ram on the horizontal member of the yoke permits the head end of the lining machine to be adjusted laterally with respect to the plow. Hence, if the plow should not be tracking true but

● Now in operation on several roads is a unit of track-maintenance equipment that's about as striking in appearance as anything ever seen on a railroad track.

Equally striking are the manpower savings ascribed to it.

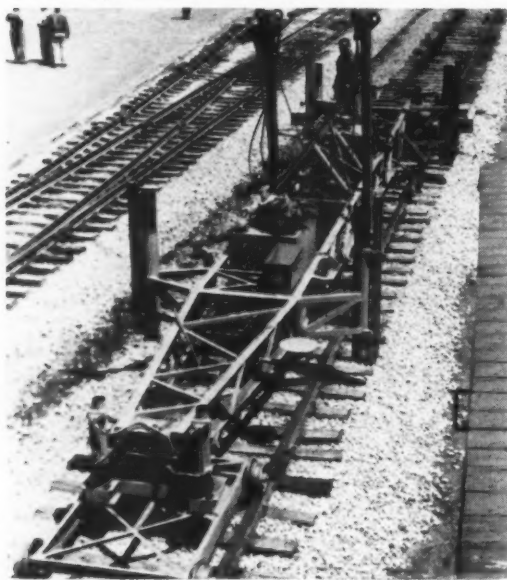
The unit actually consists of several devices built around the Mannix undertrack plow. The purpose is to effect savings by reducing the number of men required when operating an ordinary plow. These men are needed to knock down the old ties with sledges when the track is in the raised position, and to pull them out of the track with hand tongs. Another gang of men is generally required to line the track immediately behind the plow.

These man-power requirements are largely eliminated by two features incorporated in the new unit. One of

these consists of mechanical means of knocking down and ejecting the ties to be renewed. The other is a feature by means of which the track is brought approximately to the desired alinement. Other devices incorporated in the unit are designed to facilitate removal or insertion of the under-track plow (or sled) without using a bulldozer or other equipment and with fewer men.

As for the striking appearance of the new machine this is due to its unusual length and its skeleton-like construction. The overall length is 56 ft for single-track work and 5 ft longer for double track. Two shallow steel trusses extend the full length of the machine and are supported at the ends on four-wheel trucks or carts. On the trusses are supported an assembly of rams, side booms, rail clamps, and other devices, as well

## Tie ejector-liner cont'd



**MACHINE** has hydraulic motor for propelling itself and can be used for lining track independently of work train.

over to one side, the ram can be actuated as much as 12 in. in either direction to place the head end of the lining machine directly on center. This adjustment is made when the plowing or sledding is started. When it is apparent that the head end of the liner is tracking true, no further horizontal adjustment is made at the yoke.

The liner head near the middle of the frame is controlled from an operator's position placed just ahead of the rear truck. The head consists of a horizontal square frame which supports a flanged guide roller operating in a horizontal plane at each corner. The flange of each roller rides on the running surface of the rail while the roller periphery engages the gage side of the rail. When in the service position, two of the guide rollers engage one rail while the two on the opposite side bear only on the running surface of the rail. A small tolerance is allowed for tight track gage so that, in general, the rollers engage the gage side of only one rail—that toward which the track throw is being made.

A horizontal ram with a total movement of 24 in is used to move the lining head laterally in either direction with respect to the main frame of the lining machine. Hence, the track can be thrown 12 in. in either direction. If desired, a track throw of more than 12 in could be obtained by moving the head end of

the main frame over by means of the horizontal ram on the yoke.

To make the three lining pressure points effective, these points must engage the running rails at all times. This makes it necessary to provide a means of adjustment vertically because the head truck of the machine will ride the rails at a different level from the lining head and the rear truck during plowing and sledding operations. This vertical adjustment, up to 14 in, is provided by a ram at each of the three pressure points.

To permit the liner to work independently of the plow or sled, the yoke can be detached from the plow. Self-propulsion is achieved by a hydraulic motor that drives one of the axles of the head truck. The machine can move forward or backward at speeds up to 15 mph.

### Hammers, belt eject ties

The removal of ties by means of the new unit is achieved by two features incorporated in it directly behind the plow. One of these consists of two hydraulic hammers, one on each side, for knocking down the old ties (previously marked with keel) while the track is in a raised position. The other is a 36-in wide endless belt conveyor, drawn behind the plow underneath the track, which throws out the ties knocked down on it by the hammers.

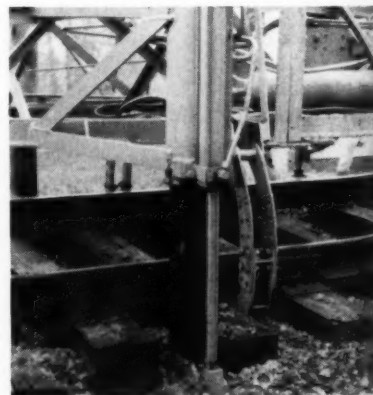


**LINING** head is controlled by levers located near the rear end of the unit where the operator can observe the alinement.

## Track is lined behind

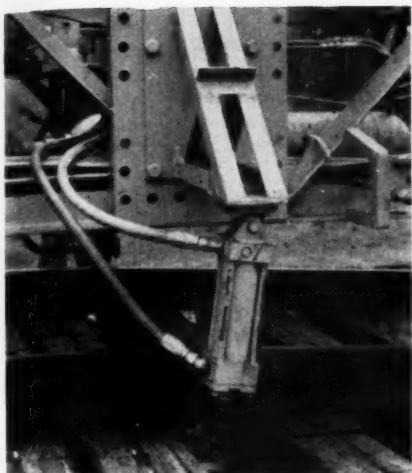
These hammers are of the instant-action type and are suspended from the sides of the main frame in a position to strike the tops of the ties at their ends. They are actuated by an operator who presses electric push buttons, one on each side, whenever he wants to eject a tie. The plungers of the hammers move out 8 in, which is great enough to push a tie from the rails by completely pulling the spikes. After striking a tie the hammers are immediately retracted automatically to avoid hitting the side of the following tie. However, should the operator miscalculate and cause a plunger to strike a tie the device merely swings back on its suspension pin and no damage occurs.

The tie-ejector belt is towed by the

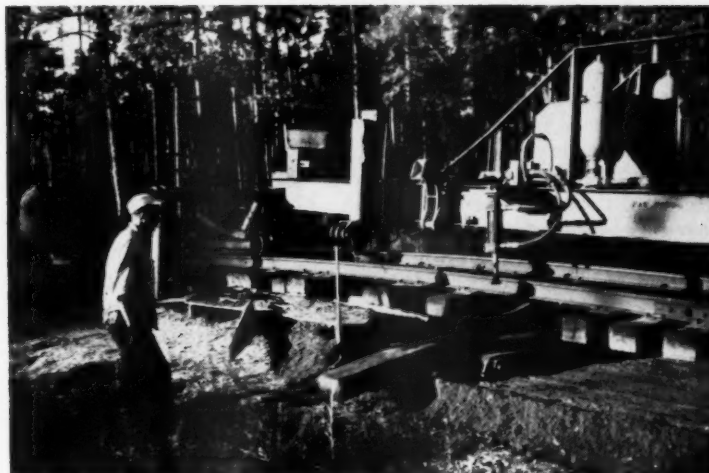


**RAIL HOOKS** swing down to engage rails. Raising rams lift track as much as 36 in.





**HAMMER** on each side replaces men with mauls in knocking failed ties from rails.



**TIES** to be replaced fall on an endless-belt conveyor which ejects them to one side. This view shows pilot model, others show production model.

## plow, ties are knocked down, thrown out

plow and is attached to it by chains at each end. It is mounted on a metal frame and is enclosed on the under side so that the lower level of the belt does not engage the ground. The belt is powered by hydraulic motors which are connected by hoses and fittings to a pump on the lining machine. It may be operated to eject the ties to either side of the track.

### Devices for easier handling

Means are provided on the tie ejector-liner frame to facilitate insertion or removal of the plow or sled, and also the handling of the machine as a whole to and from the track. These include four rail hooks, four raising rams, two side booms and a hydraulic

winch. The rail hooks are hinged and, when swung down, automatically position themselves under the running rail. When not in use, the hooks are raised and chained against the main frame of the lining machine.

The raising rams each have a movement of as much as 55 in and a total lifting capacity of 34 tons. When a ram is extended, the base of the ram engages the ballast between ties outside of the running rail. Further extension of the ram causes the liner frame to raise, the rail hooks to engage the underside of the rail, and the track to be lifted bodily. The track can be raised in this manner as much as 36 in.

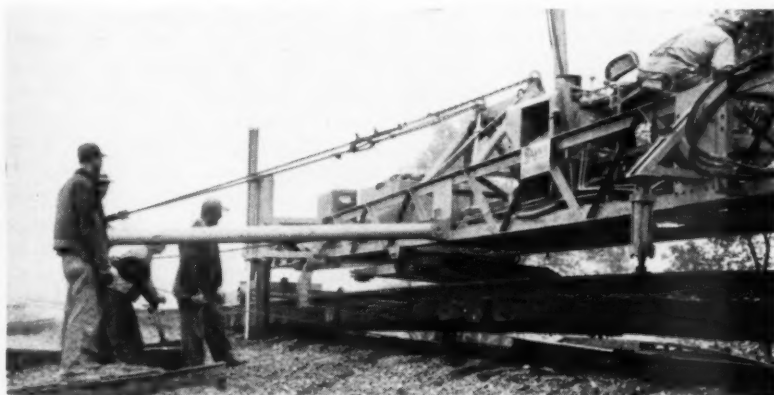
The side booms, mounted one on each side of the main frame, are 12

ft long. Each is fastened to the frame at its base by a heavy pin which permits the boom to be swung outward from a vertical down to a horizontal position. The free end of the boom has two eyes to which a snatch block can be fastened. The hydraulic winch is mounted on the frame between the bases of the two booms so that it can be used with either boom.

With the boom lowered and the track held in a raised position by the lining machine, the winch line is reeved through the snatch block and the free end is hooked to the side of the plow or sled. When the winch line is reeved in by the drum, the plow is pulled under the track or from under the track. This entire operation can be completed in 15 to 20 min. The booms are also used for handling the ejector belt to or from its position under the track.

A well-trained crew can remove the lining machine from the track in about six minutes. The machine is run under its own power to the set-off point. The raising rams are then used to lift the machine high enough so that the front and rear trucks clear the rails. The trucks are then turned 90 deg, the set-off rails placed under the wheels, and the machine pushed into the clear. When left overnight, the unit is supported by its raising rams instead of resting on the wheels.

Like the ordinary Mannix under-track plow and sled the improved unit



**SIDE BOOM** is lowered and free end of line from hydraulic winch is reeved through a snatch block and attached to plow. By this means plow is pulled under, or out from, track.

## Tie ejector-liner for track plow cont'd

with tie ejector and track liner is available for use on a footage basis. Last fall a pilot model of the tie ejector-liner went into experimental service on the Fort Worth & Denver and ever since has been in use on that road and the Colorado & Southern (both parts of the Burlington Lines). Based on experience with the pilot model a much-improved production model was developed. Units of the production model went into service on various roads early in May. Two of these started work on the Burlington, one near Scottsbluff, Nebr., and the other near Macon, Mo.

### How used on Burlington

When the operation near Macon was inspected a few days after it got underway it was found that the work consisted of plowing out the old ballast, renewing ties, raising the track on 5 in of new ballast with the sled, and giving the track a final surfacing raise of 2 in. Two Mannix representatives were present training a crew of railroad men in the use of the tie ejector-liner unit. An average

of about 4,000 ft of finished track was being produced per day. The work was being done in single-track territory.

The crew working with the combination machine consisted of 5 men.

One man walked ahead to guard against the possibility of a tie jamming underneath the plow. Another man walked along behind the ejector to keep ties from jamming there. A third, equipped with a 6-ft pole, checked the alinement with respect to line stakes that had previously been set 6 ft from the rail by an engineering party. Information for making corrections in the alinement was signaled to the fourth man who, riding on the machine, controlled the movements of the liner head. The fifth man, also riding on the machine, operated the controls for the tie hammers and the tie-ejector belt.

### Estimated labor savings

What, specifically, are the savings to be realized through use of the new machine?

When an ordinary plow is used, explains J. W. Christoff, vice presi-

dent of Mannix International, it is generally necessary to have about 12 men working with the plow, most of them knocking down and dragging out the old ties. In addition, he points out, a gang of men is generally required behind the plow to line the track. Depending on the weight of rail and other factors, Mr. Christoff estimates that use of the tie ejector-liner unit will save from 18 to 25 men in these operations.

Because of the time saved in the track-lining operation it is now possible, says Mr. Christoff, to perform a complete cycle of plowing, renewing ties, unloading ballast, sledding, unloading more ballast and surfacing on a given stretch of track in a single day. Formerly, that is, when using an ordinary plow, the usual practice was to sled in a single day the track that had been plowed for several previous days. The over-all result, he says, is increased production. For example, it is pointed out that, in the Scottsbluff operation on the Burlington, in which the plowing and sledding work is followed by a highly mechanized tie-renewal and surfacing organization, the production is running in the neighborhood of 1 1/4 to 1 1/2 miles of finished track per day.

## Tie tester uses atomic rays

● The man at the left is demonstrating the use of a tie-testing device that utilizes nuclear energy. It was developed by the Research Center of the New York Central at Cleveland and constructed by the Nuclear Science & Engineering Corp., Pittsburgh, according to an NYC announcement.

The nuclear tool is said to "feel" for hidden flaws with gamma rays. It uses a technique called "backscattering" in which low-level gamma rays from a radioactive source are reflected from the interior of a substance back to a radiation-counting device. In the case of railroad ties, a sound (or denser) tie reflects more gamma rays than a tie whose interior is porous or rotted, according to the announcement. The low-level gamma rays do not, it adds, emit sufficient radiation to be dangerous.

The tester is a package consisting essentially of a back pack worn by the operator, which contains the unit's electronic equipment, and a hand-held

pistol-grip probe. The probe contains the gamma ray source, a detector head consisting of a sodium diode crystal, and a meter or dial which gives the test readings.

By reading the dial the operator can determine "positively" whether individual ties must be renewed, says the announcement.

The selection of cesium-137 as the gamma ray source, rather than cobalt-60, which the nuclear firm used in earlier experiments, is considered one key to success of a study to determine the feasibility of the density test. It was explained this way: Gamma rays from cesium-137 are comparatively weak and do not penetrate the cross-ties to the roadbed, as do the rays emitted by cobalt-60. With no gamma rays reflected from the roadbed, more highly accurate readings were obtained, says the announcement.

The density tester is thought to have other potential applications in checking wood members and structures.



Operator tells condition of tie by reading dial mounted on top of probe.

# Asphalt-coated ballast

## Potential benefits

## spur further tests

Earlier tests have suggested that definite savings in maintenance costs are possible through the use of asphalt-impregnated ballast.

Now those possibilities are to be further explored through additional test installations sponsored by The Asphalt Institute and the Engineering Division, AAR.

But something new is to be added this time: At least some of the test sections will be located on track laid with continuous welded rail, with 78-ft and 117-ft rails, and with tight joints as well as with conventional joints.

**MAINTENANCE** data for asphalt-treated roadbed (left) on the Santa Fe near Barstow, Calif., will be compiled and compared with those for the untreated ballast (right).

● As far back as 1926, railroad engineers have been experimenting with asphalt in an effort to exclude water and fouling materials from the ballast. This year, encouraged by the performance records of these earlier tests of asphalt-treated ballast, a number of new test sections are being established.

Undertaken primarily to determine the economy of using asphalt-treated ballast on track laid with fewer rail joints, the new tests are being sponsored by The Asphalt Institute and the Engineering Division, AAR. They will be located on track laid with continuous welded rail, with 78-ft and 117-ft rails, with tight joints and with conventional joints. Several different types of ballast will be applied in the test sections, including crushed gravel, crushed limestone, crushed blast-furnace slag, crushed chat and volcanic cinders.

Two specially equipped cars for the

asphalt treatment of ballast were developed and constructed. One, the asphalt distributor unit, was built on a flat car and was equipped with a pump, a hot-oil system for maintaining heated supply lines, a tachometer for governing the asphalt distribution, and spray bars. Two of the latter are of the outrigger type for covering the track area outside the rails, resulting in a total swath of about 14 ft.

A fan-shaped spray pattern assures distribution of the hot asphalt cement while specially designed shoes prevent this material from getting on the rail treads. A swinging 22-ft overhead boom at each end of the car permits a continual supply of asphalt cement to be drawn from tank cars on each end.

### Rotary flinger spreads stone

The other car is the stone-spreading unit. This is a conventional bottom-dump hopper car of 50 tons capacity. A gas-engine generating plant is mounted within the car between the

two hoppers. This furnishes electric power for driving two motors used for flinging the screenings. A rotary flinger is mounted on each side beneath one of the hoppers and casts the stone toward baffle plates. From there the stone is spread over that part of the track area which extends from about the ends of the ties to 7 ft out from the center line of the track. The second hopper is employed to feed stone over the track area between the tie ends.

### Used on Santa Fe

The first road to avail itself of this equipment on a loan basis was the Santa Fe. This road scheduled the application of six test sections, totaling 25 miles, during April and May. These included a two-mile section near Barstow, Calif., one five miles long near Peach Springs, Ariz., a section near Albuquerque, N. M., and others near Topeka, Kan., Marceline, Mo., and Williamsfield, Ill. It is expected that other roads also will set up test instal-



## Asphalt-coated ballast *cont'd*

lations of treated ballast during the current year.

The installation at Barstow was made on a stretch of track recently re-laid with heavier rail and then rebalasted. The asphalt spray, 85-100 penetration grade, was applied at a rate of 1 1/4 gal per sq yd. It penetrated into the stone ballast to a depth of more than 2 in. The cover stone, applied at the rate of 10 lb per sq yd, served principally as a blotter course but it also filled the larger voids.

The distributor car made two passes over the test section to achieve the specified rate of application. The

capacity of the asphalt pump was limited to 1 gal of asphalt per square yard when traveling at a speed of 2 mph, or 2 gal per sq yd at 1 mph. It was found impracticable to throttle down the work train speed to a constant forward movement slower than 2 mph. It is believed that a larger pump or the use of dual distributor cars will overcome this problem.

### Tests should answer questions

It is expected that the new tests will answer some of the questions now in the minds of trackmen relative to as-

phalt-treated ballast. For instance, the tests on the Illinois Central were carried out when tie renewals and much of the other track work were done manually. The new tests will reveal the man-hours necessary for making tie renewals and surfacing track with today's equipment.

Other questions are:

What effect will modern tie-removal machines have on the asphalt coating?

What effect will the asphalt have on the track machines?

How will spot surfacing be done?

In view of the necessity of resealing the asphalt coating, will the tracks be maintained to the same standard as adjacent track?

## What earlier tests have shown

There have been two major service tests of asphalt-treated ballast in the past, one on the New York Central and the other on the Illinois Central. Here are details of these tests and what was learned from them:

### On the New York Central

The installation on the NYC, made in 1926, was a 600-ft test section of emulsified-asphalt-coated stone ballast. This installation was located on the road's east bound high-speed main track along the station platform at Byran, Ohio.

For this installation the old cemented ballast was first dug out and new stone ballast, coated with emulsified asphalt was placed to a depth of 8 in under the cross-ties. This ballast was tamped under and around 7-in by 9-in ties which had been painted on the sides and ends with emulsified asphalt. A top coat, 1 in thick, was placed over the ballast to fill the voids and completely seal the surface. This coat was a mixture of emulsified asphalt and wet sand.

The NYC kept records of the track work performed on this test section, which included the man-hours expended by both the foreman and laborers, material and equipment, as well as the type of work performed. The road reported that no work was done or any minor repairs made until August 1940—14 years after the initial installation—at which time the seal coat was removed in a few places where it had been shattered and was replaced with new material. It was noted that some track creeping had opened up cracks between the edges of the ties and the seal coat. These were filled with a mixture of sand and asphalt.

During the years 1941 to 1944, inclusive, other minor ballast repairs were made. These included the raising of a few low joints, the tightening of some loose ties and the renewal of some ballast in the cribs east of a highway crossing. New rail and fastenings, except plates, were laid through the test section in 1942.

### Labor cost was low

The cost of maintaining the track in the 600-ft test section was found to be relatively low. For the five years 1940-1944, inclusive, an average of 42 man-hours of the foreman's time, 108 man-hours of the sectionmen's time, 0.9 cu yd of sand, 0.4 cu yd of stone ballast and 192 gal of emulsified asphalt were used annually on the maintenance of this track. Rail-relay work was not included in these averages.

Reports on this test were favorable. The track had good riding qualities under high-speed operation. It stayed in good line and surface—in fact, it preserved these qualities more than conventional stone ballast. Also, because emulsified asphalt was used instead of the hot-mix type, the ballast mixture remained pliable so the track could be worked whenever low spots developed and the seal coat could be restored.

However, apparently there was some speculation among maintenance officers that perhaps it was not necessary to treat all of the ballast in the section with asphalt. Sooner or later the cross-ties would wear out and the renewals no doubt could be made easier in conventional ballast than in asphalt-treated ballast. This engendered the idea of providing an asphalt seal coat as an umbrella over the ballast section. It

was reasoned that the elimination of water and foreign matter from the ballast would produce a dry roadbed and uniform track conditions that would reduce maintenance.

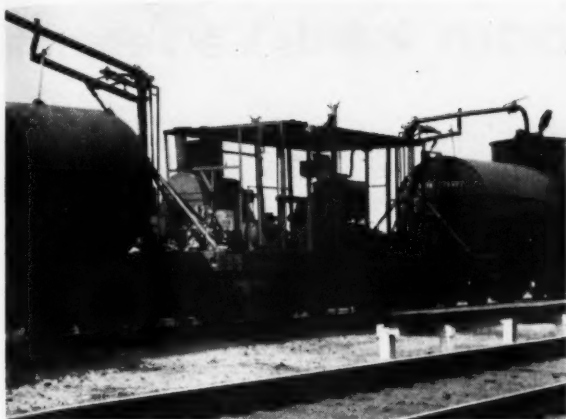
### On the Illinois Central

Because of this interest, the Illinois Central installed a 1/2-mile test installation of asphalt-penetrated ballast with a seal coat near Manteno, Ill. This test was sponsored by The Asphalt Institute and received the cooperation of the Engineering Division research staff of the AAR.

In setting up this test section, the ballast was first cleaned, the track raised 6 in on new ballast, all necessary tie renewals were made and new 131-lb rail laid. After the track was tamped, Texaco No. 96 asphalt paving cement, heated to between 275 and 350 deg, was applied by a distributor truck mounted on the rear of a flat car. Following the asphalt application, a layer of limestone screenings was spread, broomed and tamped. A second application of asphalt and the seal coat aggregate was spread over a swath 12 ft wide. About 7,200 gal of asphalt were used, resulting in a penetration of from 3 to 4 in.

Following the installation, the Illinois Central maintained records of the labor and material required to keep the test track up to the desired standards.

The majority of the labor was required for restoring surface. Appreciable lining operations were required only one year in the 10. The surfacing procedure consisted of what was called "end paddling." This involved the cutting away of the asphalt-impregnated ballast from the ends of the ties, jacking the track to the required grade, and inserting chats or screenings under the ties by means of a long smooth steel blade. In 1948, this procedure was varied to



**DISTRIBUTOR CAR** is assured an adequate supply of asphalt by provision of overhead pipe connections to adjacent supply cars.



**HOT ASPHALT** is spread by outrigger and undercar spray bars. Specially designed shoes prevent the rails from being coated.

permit the injection of a sand-cement slurry under the ties through pressure supplied by a small mud-jack.

In addition to the labor requirements, the test section required additional asphalt and screenings for resealing the surface. Annual requirements varied from 600 to 1,000 gal of asphalt and from 10 to 20 cu yd of screenings for the period 1947-1952 inclusive.

#### **Committee reports favorably**

After an inspection in the summer of 1953, it was agreed that the test section had fulfilled its life and that conditions were such that an out-of-face surfacing was required. The AREA Roadway and Ballast committee concluded that asphalt-treated ballast is practical and beneficial. It also concluded that the economic life of this test section was seven years, because the section labor required during the last three years of the test period was in excess of that for the entire division on a per-mile basis. It was reported that the track drained well, that dust and cinders were kept out of the ballast and that there was less pumping than on conventional track. In general, the track reportedly rode well and the asphalt ballast was effective in maintaining line.

An interesting observation made by the Roadway and Ballast committee was that the greatest saving was in cross-ties. The seal coat sealed the checks and splits, prolonging the life of the ties to the extent that renewals on this section were half of those on adjacent track.

Experience with this test track showed that the maintenance work required was primarily centered at the rail joints. On this evidence it was pointed out that the economic life of asphalt-treated track would be materially increased by the use of continuous welded rail.

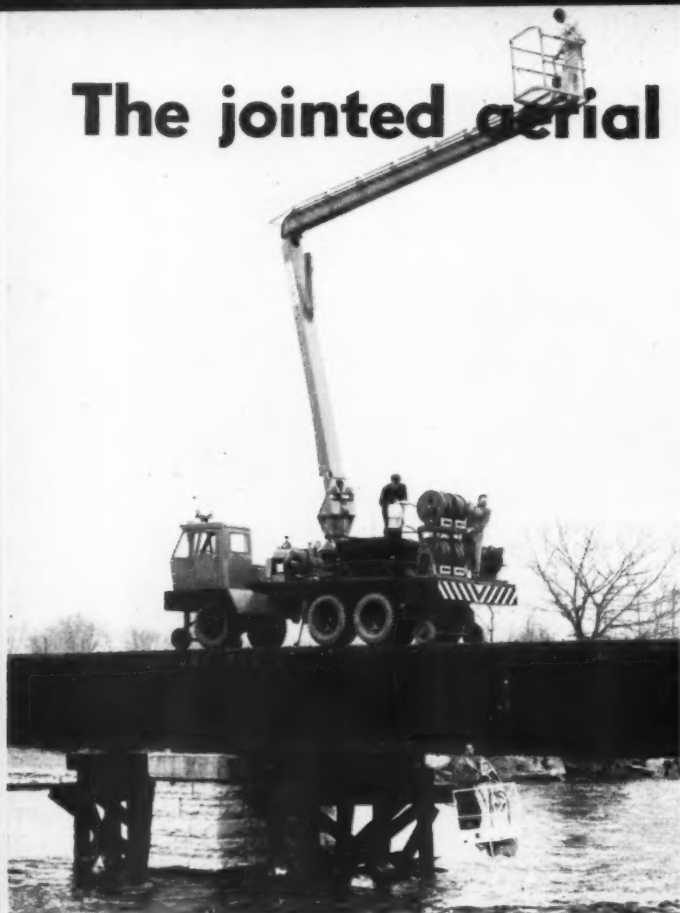


**TWO PASSES** were made over the test section to achieve the specified rate of application of  $1\frac{1}{4}$  gal per sq yd. This penetrated the stone ballast from 2 to 3 in.



**STONE** aggregate of small size is spread evenly over the treated ballast by rotary flingers installed beneath bottom-dump hopper cars.

# The jointed aerial boom ▶▶ It's a versatile, cos



From all over the country are coming reports of surprising savings from a device that's relatively new in the railroad field—the articulated aerial boom fitted with a personnel platform at the outer end and mounted on a mobile carrier, sometimes equipped with flanged wheels.

Bridge and building forces are finding numerous applications for it, but it's also doing many jobs for the water service, electrical and communications departments.

Big reason for its popularity: The need for scaffolding is eliminated.

It gives more reach in many places

**HANDLING** of Spider staging is demonstrated by this Strato-Tower mounted on a Schield Bantam carrier with flanged wheels.

● "One side of an ordinary building can be painted in the length of time it takes to properly erect scaffolding," said a top engineering officer. Said another: "In painting the inside of the back shop one man in five days did the work which would ordinarily require six men for eight days."

In both cases these men were talking about their experiences with a relative newcomer to the ranks of the machines used by railroad maintenance-of-way and structures forces. They were referring to the jointed or articulated boom with a working platform at the outer end.

These comments are samples of many heard from railroad engineers around the country during a recent survey to find out the extent to which aerial booms are being used by the railroads, what they are being used for, and the benefits they are producing. One engineering officer summed up the whole matter in a few words when he said he had "found this equipment to be very valuable for any work where it is necessary to get off the ground."

And that's exactly where the aerial boom shines. It's a means of getting

one or two workmen off the ground without the use of scaffolding and of giving them a high degree of flexibility in positioning themselves for the work at hand which may consist of a wide variety of jobs, ranging from painting to tree trimming. By eliminating the time and labor involved in putting up and removing scaffolding the jointed aerial boom appears, on the surface at least, to afford a means of effecting substantial savings. And the experience of railroads that have used them confirms this impression.

This question remains: To what extent is the jointed aerial boom applicable to those railroad jobs which now require scaffolding? The answer to this question must be determined by each railroad individually. One terminal line with a considerable number of steel bridges to maintain estimates that the use of a jointed boom would make it possible to eliminate the scaffolding for about 25 per cent of the maintenance work required on these bridges. Experience of other roads indicates this estimate is conservative.

Jointed aerial booms are now available from a number of manufacturers (see descriptions right). While there

are naturally many variations between the different makes, there are certain basic characteristics common to all of them. One is the two-section articulated boom. Another is the working platform at the end of the outer section, which is generally in the form of a "basket" or "crows' nest," accommodating two men. For mobility the booms are mounted on rubber-tired vehicles and in a number of recent instances these have been equipped with

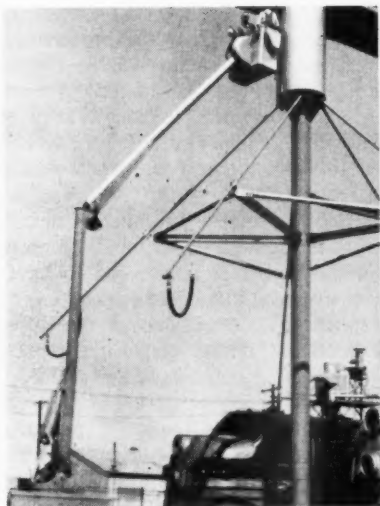
**Articulated booms are offered by several manufacturers. At the right and on following pages are presented brief descriptions of six different makes.**



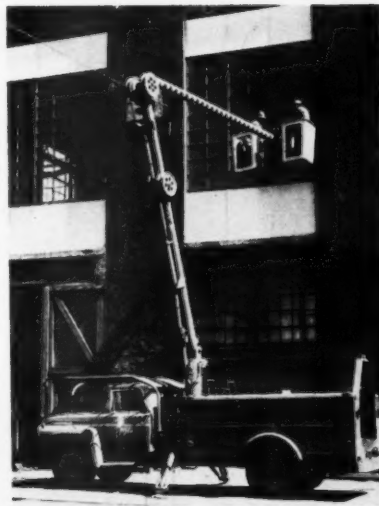
# le, cost-saving tool for railroad B&B forces



**BRIDGE INSPECTION** using a Skyworker mounted on a Schramm Pneumatractor.



**OVERHEAD** sand-storage tower is brought into easy reach by Hi-Ranger aerial boom.



**WOOD SASH** in a shop building are replaced with steel sash using a Sky-Master.

adjustable flanged-wheel attachments to permit on-track operation.

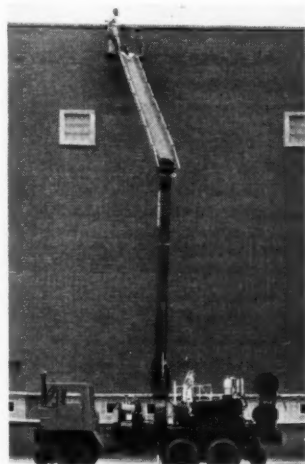
Control levers governing movements of the boom are generally placed at the working platform as well as below on the carrier. With these controls, and because of the articulated nature of the boom, the men have great flexibility in reaching working areas within a considerable radius in all directions from the carrier. The fact that the crows' nest can generally

be lowered below the ground level adds to the flexibility of the unit, especially for bridge work.

Articulated booms acquired for use by bridge and building departments are generally provided with paint spray equipment, complete with pumps, tanks, hose reels, compressor, and other necessary auxiliary units, all mounted on the carrier. In some cases this has included equipment for handling and heating roof and tie coatings

and grease-type coatings for bridges. Connections for paint or other coatings are provided at the crows' nest, along with air outlets for cleaning or the operation of portable tools.

The exact nature of the auxiliary equipment to be provided for use with a jointed boom will, of course, be determined by the work in which it will be engaged. Such booms may be acquired for some specific task. One road, for example, purchased a truck-



## Strato-Tower

Models of the Strato-Tower are available with maximum platform heights ranging from 35 ft to 95 ft. Working platform has one-lever control for all movements. Platform is said to be self-leveling and can be folded when boom is lowered for passage through low doors. Booms are directly controlled by double-acting hydraulic cylinders. Oil pressure is developed by Vickers vane pump driven by Wisconsin air-cooled engine. Swing table rotates through angle of 280 deg. Outriggers are hydraulically controlled. Manufacturer says unit

may be mounted on almost any truck, jeep, flat car, truck trailer or industrial truck. Unit shown is mounted on Schield Bantam carrier with flanged wheels. Upper boom section has folding safety rails to permit use as catwalk. *Strato-Tower Division, Young Spring & Wire Corp., Dept. RTS, P.O. Box 103, Elkhart, Ind.*

## Hi-Ranger

A number of models of the Hi-Ranger aerial boom are available, with reaches varying from 24 ft to 100 ft, depending on the requirements of the user and the model specified. The operator's baskets are designed to carry one or more men and a variety of accessories depending on the work to be done. Baskets are said to be actuated in any or all three dimensions simultaneously by a single "3-D" control. When vehicles on which booms are mounted are equipped with hydraulic power packs, the manufacturer points out that the standard Hi-Ranger accumulator type system can be coupled directly with no additional equipment required. Operator's baskets can be equipped with electric lines, a variety of fluid handling lines and other devices. *Mobile Aerial Towers, Inc., Dept. RTS, 1730 No. Harrison St., Fort Wayne, Ind.*



## The jointed aerial boom cont'd

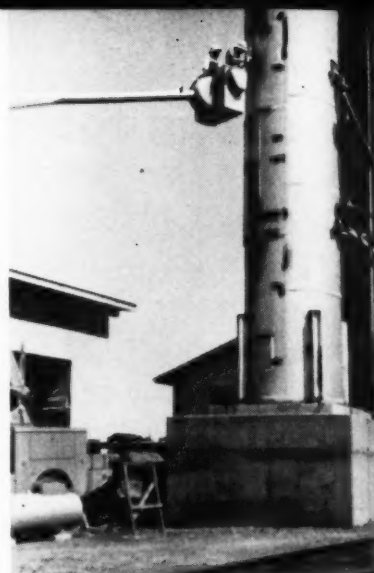


ALL PARTS of most buildings are readily accessible to baskets of aerial booms.

mounted jointed boom primarily for use in trimming trees along communication and power lines. However, since it is recognized that the savings from such equipment will be determined largely by the amount of time it is kept busy, the tendency is to provide the auxiliary equipment necessary to give the unit the widest possible versatility.

Because of its special characteristics the jointed boom mounted on a mobile carrier is considered to have year-round utility. For example, one road that acquired one of the units expects that during the regular working season it will be used exclusively for bridge painting, the painting of building exteriors, and for masonry repairs and other work that must be done in good weather. During the remainder of the year it will be used for making repairs and doing painting work on the interiors of large buildings, for small structural repairs, and for doing repair work on power and communication lines.

This company, incidentally, points to an advantage of the aerial boom that conceivably could be overlooked. With a unit of this type available the company feels it would be able to do spot painting and other minor repairs which are sometimes postponed because of the excessive cost of making the necessary preparations for small jobs. The reasoning is that such



SPOT WORK on stack is performed from platform of jointed boom.

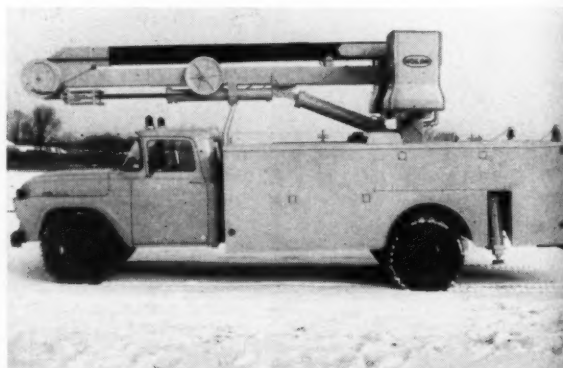
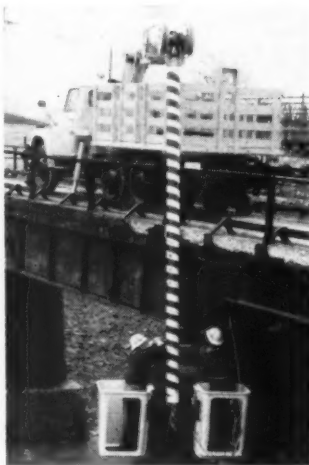
minor defects will thus be repaired before they are allowed to grow into major projects.

Precisely what are the jobs for which aerial booms have been used? This question was put to maintenance officers of several roads that have mobile aerial booms in service. Here's a composite list based on their replies:

- Painting of bridges, buildings, pipes, tanks
- Applying roof coatings
- Applying grease-type coatings to bridges and other structures
- Applying protective coatings to wood decks of bridges and trestles
- Inspecting bridges and buildings
- Repairing overhead steam lines and other piping

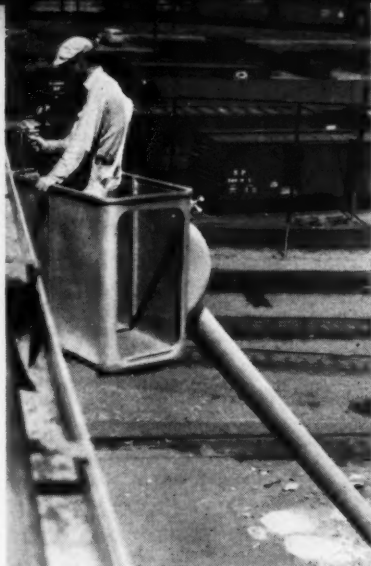
### Sky-Master

Recent addition to the line of aerial booms carrying this trade name is a unit designed specifically for railroad use. It consists of the Sky-Master aerial boom installed on a rubber-tired vehicle equipped with flanged wheels that may be raised or lowered hydraulically. Sky-Master is available in one and two-man models having ground-to-basket-floor heights ranging from 37 ft to 43 ft. They may be installed on a standard Powers-American body or on a body designed to fit specific job requirements. Outriggers are controlled hydraulically by levers which can be installed in any location desired, according to manufacturer. The rotating mast can be rotated continuously in either direction. Control is by three levers at work basket, with additional set on mast. McCabe-Powers Body Company, Dept RTS, 5900 No. Broadway, St. Louis 15, Mo.



### Holan Elbow

Aerial booms of this type have a maximum ground-to-floor height of 36 ft 10 in. The mast rotates 360 deg continuously in either direction. Boom sections are controlled by double-acting hydraulic cylinders working in combination with aluminum drive sheaves. Work buckets have direct-acting, aircraft-type controls actuated by three levers on support shaft of bucket. J. H. Holan Corp., Dept. RTS, 4100 W. 150th St., Cleveland 35, Ohio.



**ELIMINATION of scaffolding adds to economy of spray painting.**

Replacing and repairing window sash  
Trimming trees  
Tightening bolts in trestles  
Overhead welding when constructing buildings  
Cleaning bridge seats  
Repairing sand towers  
Scaling rock slopes in cuts  
Repairs and other work on pole lines

When asked about the savings realized as a result of the use of aerial booms railroad men who have used them seem to have plenty of ready examples. Several were mentioned by a man on a road that has a number of the units in operation. In one case, he said, the painting of a 65,000-gal steel tank and tower required only 24 man-hours of labor, whereas 96 man-hours

would otherwise have been required.

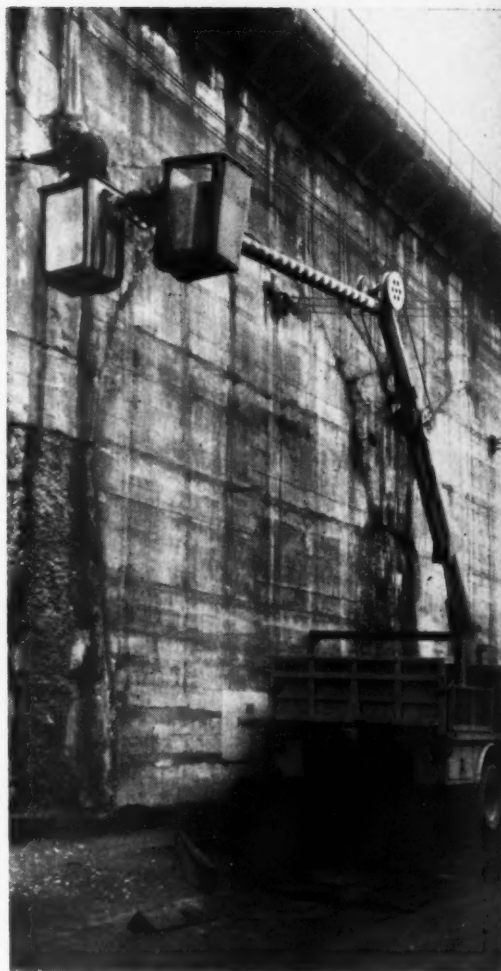
In another case, cited by this same man, a welder engaged in erection work on a building did as much work in 20 days as three men would have done if conventional scaffolding had been required.

In a more general vein it is estimated that on one division of this road a jointed aerial boom is saving the time of four men. It is being used on this division almost continuously by the B&B, water service and electrical departments.

The chief engineer of another road cited an example in which an aerial boom was used to paint the window sash and flashing in a 3½-story building where the design prohibited the use of ladders. The estimated saving, he said, was 20 per cent. He went on to say that, in his experience, the largest savings with such equipment are found on jobs of short duration, such, for example, as replacing a broken window glass or renewing an elbow in a sand tower.

An engineering officer of another road explained that, where an aerial boom is used to apply roof coating, it will be able to coat several hundred square feet before conventional scaffolding or material-handling devices could be placed and put in service.

All those queried on this subject expressed themselves as being highly satisfied with the service and savings they are deriving through the use of jointed aerial booms.



**ALL PARTS of this masonry wall are brought within reach—without scaffolding.**



### Skyworker

Specialized models of this aerial boom have been developed for different applications. These are known as the "Tree King" (for line clearance), the "Tele-King" (for telephone work), the "Lamp King" (for street light work), and the "Plant King" (for industrial maintenance). The latter is available in three models with heights ranging from 26 ft 10¼ in to 36 ft 2¼ in. *Emhart Manufacturing Co., Skyworker Division, Dept. RTS, Milford, Conn.*



### Aerial Platform

Two models of this type are available. Model 40-HD has a maximum ground-to-platform height of 35 ft. For Model 50HD this height is 45 ft. Valves of the hydraulic system are said to be operated by special cable controls, with control levers on the operating platform and on the turntable. Boom rotation is 360 deg, continuous in either direction. Standard working platforms have tubular steel frames which may be dipped in microsol insulating solution. Out-riggers are of the A-frame type. The aerial platform may be powered by a separate power

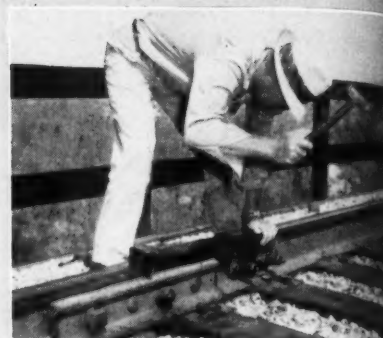
source or by the truck engine through a power take-off. Optional equipment includes power take-off package or a separate power package that includes a Wisconsin Model A. G. N. air-cooled engine and a hydraulic pump. *Pitman Manufacturing Company, Dept. RTS, Grandview, Mo.*



**Here's the  
sequence  
of operations**



**1** With aid of template a hack-saw blade is used to mark rails for sawing.



**2** Location of bolt holes is marked by hammering punches in template.



**5** Old bolts are removed with power bolting machine, and cut-off rail sections are then knocked out of position.



**6** Sawed rail ends are ground as necessary and burrs are removed from newly drilled bolt holes.

## How the SP crops rails in track

Last year this road started the practice of field-cropping rail under certain conditions. For doing the work it has developed an organization built around portable power hack saws. The overall cost is averaging about \$13.00 per rail.

● Opinion on the Southern Pacific is that the cropping of rails in track is economically justified under certain conditions on the basis of the extended service life obtained from the rail. The road started the practice in 1958 and cropped the rail in a total of 35 miles of track that year. The program for 1959 calls for the cropping of about 60 miles.

The field-cropping work is being done at an average cost of about \$13.00 per rail. This includes all labor costs as well as the cost of the reformed joint bars applied to the cropped rail, and all new material re-

quired, such as bolts, lock washers and spikes.

Aside from the long-range economics of the practice, officers of the road argue that it has immediate benefits. As an illustration they point out that, by its field-cropping activities in the recession year of 1958, the road was able to reduce its new-rail requirements in that year by a considerable amount.

The rail involved in the cropping program has consisted mostly of the 113-1b headfree section, although other sections have also been cropped. Because of the possibility of de-

tail fractures developing in older rail, the road does not crop rail that has carried more than 300 million gross tons of traffic.

Because reformed bars are applied when rail is cropped in the field there has been some thought that the road may run into a shortage of such bars. However, since the SP is planning to start the practice of butt-welding secondhand rail for use on branch lines, it is expected that this practice will result in an ample supply of secondhand bars for application to cropped rail.

Out of its experience with the field cropping of rail the road has developed a highly mechanized organization for doing the work. The actual cropping is done with Racine power hack saws, but a variety of other types of machines are also used for the other operations.

A typical rail-cropping organiza-



**3** Bolt holes are drilled by two power drills working in tandem. Pilot holes had already been drilled by signalmen.



**4** Power hack saws are employed for cutting rails. Six saws are used, with a seventh available as a standby unit.



**7** Gaps are closed by pulling rails with "tugger hoist." Two rails are pulled back from one position of hoist.



**8** Reformed bars are applied and nuts are run up with second bolting machine. Output is 26 to 34 joints daily.

tion was recently seen in operation on the SP's Los Angeles division. This gang consisted of a foreman, an assistant foreman, 3 machine operators and 17 laborers. In addition, there were two signal men and two men from a district welding gang who were engaged in end-hardening the cropped rail ends. Because of the rather sizable concentration of machinery in the operation a division mechanic was spending part of his time with the gang.

The gang was working in single-track territory and was cropping 18 in from the rail ends in a 10-mile stretch of 132-lb headfree rail that had been laid in 1948. The rail had developed considerable wear in the fillet areas at the ends, and about 75 per cent of the rail ends were battered to some extent.

Ahead of the cropping gang a 39-ft rail had been distributed every 13 rail lengths for insertion in the track to make up for the loss of length due to the cropping. The practice was to crop and drill these rails during periods of time when the gang had cleared

the track for train movements.

On the average the gang had to clear the track for the passage of eight trains each day. Its production was ranging from 26 to 34 joints per day depending on traffic. The general procedure was to crop the rails on one side one day and then to drop back and work on the other side the next day.

Here is the sequence of operations and the equipment used:

In advance of the gang the rails were marked for cutting and drilling by a laborer using a template. In about 30 min this man could mark enough rails to keep the gang busy all day. Afterward he was available for other work such as knocking out the cropped rail ends.

The two signal men, using a bonding drill, then drilled the holes for the bond wires and also pilot holes at the locations of the bolt holes. These were carried about half way through the webs and helped to speed up the actual drilling operation. The two signalmen later applied the signal bonds to the cropped rails.

## Heat treating the ends

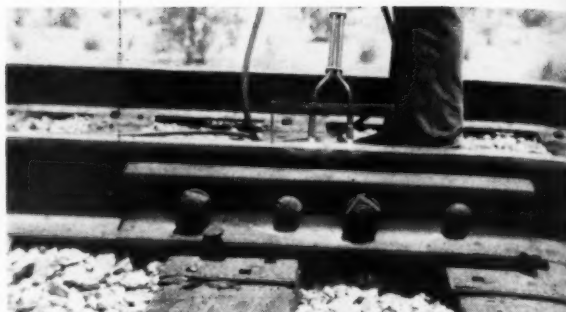
The new bolt holes were then drilled by two Nordberg power drills working in tandem, each manned by an operator. They were followed by the rail saws. Six saws were in use, and a seventh was on hand as a standby unit. One man was assigned to each saw, but two additional laborers were available to assist in moving the saws and drills forward. If there was a tie plate under the rail at the sawing point it was removed and the rail wedged up with a spike to facilitate sawing.

Following the sawing operation a man with a Nordberg bolting machine removed the old bolts after which another man ground the sawed rail ends as necessary, and also removed burrs from the newly drilled bolt holes. This was done with a gasoline-engine-driven flexible-shaft grinder with the power plant carried on a wheelbarrow mounting with a rubber-tired wheel.

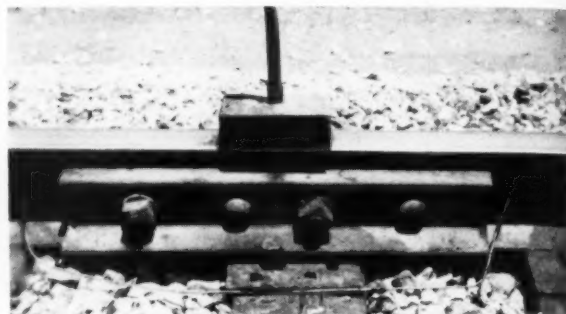
Next the gap created by the crop-



**TORCH** with twin nozzles and long handle makes it possible for operator to heat both rail ends simultaneously while standing.



**HEAT TREATING** of rail ends is done with twin-nozzle torch with extended handle. Compressor, tanks, etc., are on push car.



**RAIL ENDS** are cooled with compressed air applied through a box from which air is discharged through small perforations.

## How SP crops rails in track *cont'd*

ping operations was closed by pulling the cropped rails back with the aid of a winch powered by a gasoline engine. Called a "tugger hoist" on the job, this unit was mounted on rollers so it could be moved along on the rail with the aid of wheelbarrow-type handles. The practice was to pull two rails back from a single position of the winch. Before pulling the rails the anchors were removed from them

but the spikes were left in place.

To anchor the winch a rod was inserted through a hole in the base and one of the new holes in the rail. To keep this rail from moving while the winch was in use the practice was to apply anchors against 7 or 8 ties.

The pulling operation required a man for operating the winch, a man for handling the cable and the rail tongs at the end of it, and two men

for guiding the rails as they were being pulled over the tie plates.

After the cropped rail ends had been pulled together Texaco 904 grease was brushed on the webs and fillet areas and the reformed angle bars were applied, with the nuts being run up with a second Nordberg bolting machine. A machine operator and two laborers were engaged in this work. As the final operation the rail ends were hardened with oxy-acetylene equipment.

Near the close of the working day the men at the head end of the gang drop back to do clean-up work which includes the reapplying of rail anchors and the insertion of closure rails. Closure rails of varying lengths, along with other tools and supplies, are carried along with the gang.

An interesting innovation seen in use by this gang consists of "D" bars for making sawed rail ends safe for traffic while the severed ends are still in position. These bars are 48 in long and have six bolt holes, four to correspond with the existing bolt holes and two (one at each end) with the newly drilled holes. To make a sawed joint safe for traffic the existing joint bars are removed and a pair of the "D" bars applied and bolted as necessary.



**SAWED RAIL ENDS** are made safe for traffic with ends still in position by application of "D" bars. These are 48 in long and have six bolt holes.





East Walpole, Mass.

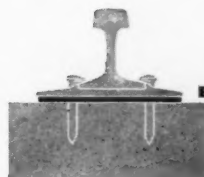
mile . . .

after mile . . .

after mile . . .

**BIRD SELF-SEALING TIE PADS  
ARE SLASHING TIE RENEWAL COSTS**

Bird Self-Sealing Tie Pads positively seal out moisture and abrasive materials from the vulnerable underplate and spike-hole areas. They extend average tie life at least 50%. For proof positive, write for booklet to Department HTS.



In-track  
experience  
proves . . .

**BIRD TIE PADS**

save up to  
\$1000.00  
per mile  
per year



#### SP to eliminate horseshoe curve

The Southern Pacific has started construction on a line change which will eliminate its 78-year-old horseshoe curve, located 80 miles east of El Paso, Tex. Costing more than \$2 million, the project will include 9.29 miles of new main track and sidings

and 75 miles of CTC. The new alignment will eliminate 30 curves and permit passenger train speeds of 75 mph, 45 mph more than at present. Freight trains will operate at speeds up to 65 mph. The horseshoe curve was originally constructed to gain elevation and still maintain grades over which trains could economically operate.

## News briefs in pictures . . .

#### "Longest" vertical lift span

On May 31 the 558-ft center section of the new bridge the B&O is constructing over Arthur Kill between Arlington, Staten Island, N. Y., and Elizabeth, N. J., was moved into place on barges. Claimed to be the "longest vertical lift span" in the world it will provide a clear navigation channel 500 ft wide.



#### Monorail to have gyroscope

A monorail transit system, called the Gyro-Glide, is being developed by the Northrop Corporation, Norair Division, Hawthorne, Calif., as a possible solution to the traffic problem confronting metropolitan areas. The new system is expected to

cost between \$1 and \$2 million per mile and would utilize existing rights of way. Heart of the propulsion unit is a 1,000-lb inertial flywheel which, after being set in motion, whirls at high speed, turning a generator which provides current for the traction motors. The flywheel also acts as a gyroscope to resist sway.

Spikes set up straight and true by the Racor Dual Spike Setter are firmly, quickly driven by this Racor Dual Driver.



## This Racor Spiking Team can do the work of a dozen men

**RACOR DUAL SPIKE SETTER AND RACOR DUAL DRIVER  
CUT COSTS, SPEED RAIL LAYING, AND IMPROVE TRACK**

Once, as many as twenty-one men were required to set and drive spikes. Now nine can do the job better and faster than ever before with the new Racor Dual Spike Setter and Racor Dual Driver doing the work of twelve men. Just one or two men are required to position spikes ahead of the Racor Dual Spike Setter which moves in, vertically aligning each pair of spikes and setting them straight with a single, always accurate blow from an air hammer. The Racor Dual Driver completes the job, driving two spikes at once quickly and uniformly. It can also be used to drive Racor studs for better line and gage holding, and wear reduction. As a result this equipment pays for itself in just a few months through faster spiking, smaller spiking crews, easier operation, uniform spiking, and reduced maintenance and down time.

See your American Brake Shoe representative today for complete details on how the Racor Dual Spike Setter and Racor Dual Driver can bring major savings to your road.



A-2204



RAILROAD PRODUCTS DIVISION  
530 Fifth Avenue, New York 36, N. Y.  
In Canada: Dominion Brake Shoe Company, Ltd.





One-man operation for . . .

### Electric cross grinder

DESIGNATED the Model X-61-E, a new portable electric cross grinder, or slotter, is available for use with the same welding generator sets that are used for electric welding of rail ends. The new unit is stated to be easily moved, mounted and

operated by one man, who can also quickly remove it from the track by means of a peripheral framework which forms a protective cage around the machine. It is designed to permit the operator to roll the entire unit over and off the track without damage to the working parts. Over-all dimensions of the machine are as follows: Height, 24 in; width, 21 in (measured along the axis of the track with the grinder mounted for operation); and length, 33 in (exclusive of outrigger). Weighing 195 lb, the unit is claimed to have a rigid construction and a balanced design which ensures smooth operation with little vibration and long service life. Equipment includes a 1½-hp, 220/440 volt electric motor and starter box. Grinding wheels, 8 in. in diameter and having a ⅝ in bore, are also available in various thicknesses. *Railway Track-work Company, Dept. RTS, 3207 Kensington Ave., Philadelphia 34, Pa.*



MODEL HR8-I International Danco Rotary Mower, mounted on a Farmall 460 Tractor.

High-speed mowing with . . .

### Rotary mowers

FOUR heavy-duty, center-mounted International Danco Rotary Mowers are available for use with the company's Cub and Farmall Tractors. Built for sustained, high-speed mowing under adverse conditions, the mowers are claimed to have the strength to withstand the constant shocks and strains of cutting and shredding heavy grass, thick weeds, stalks and brush, up to 12 in. in height.

Model C-I is built for use with the Cub Lo-Boy Tractor. It cuts a full 60-in swath and has a cutting height of 1 to 8-

in. The mower is stated to cut 12 to 15 acres per day.

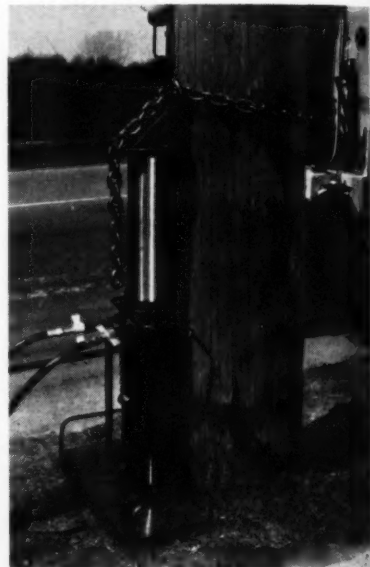
The cutting width of the Model H-I, built for use with the Farmall 240, is 58 in with a cutting height of 2 to 10 in. Cutting capacity is claimed to be 20 to 25 acres in a 10-hr day.

A swath 66 in wide is cut by the Model HR-I working with the Farmall 340. Its cutting height is 2 to 12 in with a cutting capacity of 20 to 25 acres per day.

The Model HR8-I has a cutting width of 94 in, a cutting height of 2 to 12 in and a cutting capacity up to 45 acres. It is built for use with the Farmall 460 Tractor.

The manufacturer states that the center

mounting of the mowers under the tractor provides compactness for good tractor maneuverability and results in a low center of gravity. This feature is claimed to enable the tractor to mow safely on slopes. On steep slopes, it will slide instead of tipping, it is stated. Each of the models are said to feature a high, full-opening front for effective cutting and shredding and Hydra-Touch control for adjusting the cutting heights from the tractor seat. *International Harvester Company, Dept. RTS, 180 North Michigan Ave., Chicago 1, Ill.*

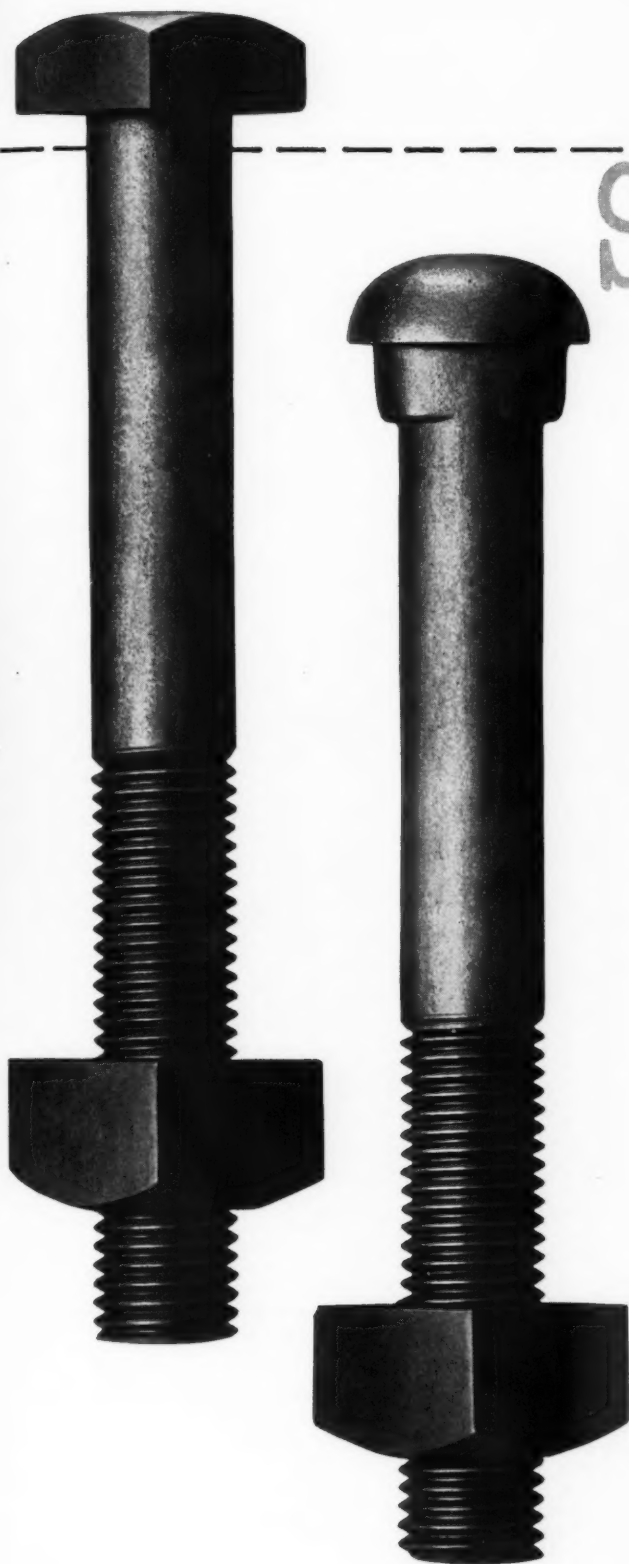


Lift 42,000 lb with . . .

### Pole jack

POLE-PULLING is speeded and physical effort is eliminated, the manufacturer states, by the use of the new Holan Series 4600 Pole Jack. The jack weighs 96 lb, operates at a maximum of 1500 psi and has a lifting capacity of 42,000 lb. It is equipped with a 6-in diameter, hard-chromed, double-acting ram that has an 18-in stroke. A detachable base plate is provided which weighs an additional 43 lb. The jack and base are arranged in such a manner that the jack can be tilted to allow for uneven ground. One man carries the unit and sets it next to the pole to be jacked. He then wraps a chain around the pole and through the hole in the casting on top of the ram. The hydraulic lines are connected from the jack to a four-way valve which is mounted on a truck body. Pulling a control lever activates the ram. Design features include a shield around the top of the ram to prevent the chain from hanging against the piston and a scraper ring which keeps ice, dirt and other particles from getting between the casing and the piston. *Holan Corporation, Dept. RTS, 4100 West 150th St., Cleveland 35, Ohio.*

# Fast Shipment of Frog Bolts



Bethlehem stocks a full range of sizes ( $\frac{7}{8}$ -in. to  $1\frac{1}{2}$ -in. diameters, inclusive). Square head or button head oval neck.  $4\frac{1}{2}$  inches of thread on every bolt. Made of medium-carbon steel, quenched and tempered. Bolts can be furnished with low or medium carbon, square or hexagon nuts in American Standard Regular, Heavy, or  $\frac{1}{4}$ -in. thicker than standard dimensions. For quick delivery of frog bolts (and other railroad track fasteners), call our nearest sales office. Or write to us at Bethlehem, Pa.

BETHLEHEM STEEL COMPANY  
BETHLEHEM, PA.

Export Distributor: Bethlehem Steel Export Corporation

## BETHLEHEM STEEL

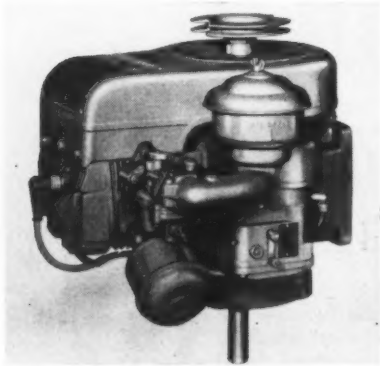


## Products (cont'd)

For post-emergence use . . .

### Herbicide

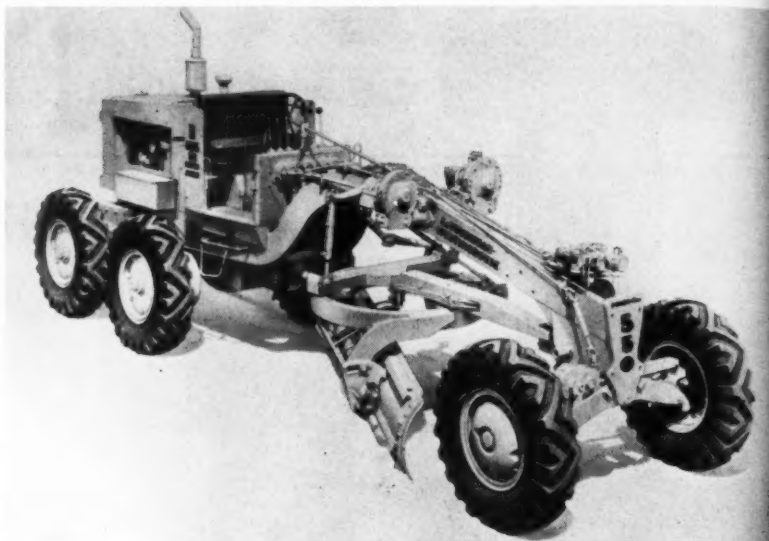
A NEW triazine, post-emergence herbicide has been introduced for non-selective weed control in non-cropped areas. Designated Prometone 25E, the material is 25 per cent emulsified solution and is a chemical relative of the company's Simazine and Atrazine herbicides. The manufacturer states that Prometone 25E controls most annual and many perennial weeds and grasses and that it appears promising for the control of Johnson grass and Bermuda grass. The new herbicide is claimed to be most effective when it is applied within two or three months following weed emergence and at a time when there is adequate rainfall to move the chemical into the root zone. The effectiveness of the material is said to be due to its top killing activity combined with its action through root absorption. The chemical is stated to be non-corrosive to spray equipment and to be low in toxicity to man and animals. *Geigy Agricultural Chemicals, Division of Geigy Corporation, Dept. RTS, P.O. Box 430, Yonkers, N.Y.*



Two new models of . . .

### Vertical-shaft engines

INTRODUCTION of two vertical-shaft engines are announced by the Wisconsin Motor Corporation of Milwaukee, Wis. These are the first models of this type of engine that have been produced by this company. They are said to be designed for compact low-silhouette applications and to be heavy-duty power units. The Model HACN has a power range of from 2.5 hp at 1600 rpm to 6 hp at 3600 rpm. The power produced by the larger model, HBKN, ranges from 3.5 to 7 hp within the same speed range as the other model. Features include a vane-type oil pump, a built-in mechanical fly-ball governor that is said to require neither oiling nor adjusting, an industrial-type carburetor with semi-automatic choke, and oil-bath-type air cleaner. Ignition is supplied by an outside-mounted high-tension magneto that is sealed against dust and weather. It is equipped with an impulse coupling to produce a strong spark for easy starting at low cranking speed. *Wisconsin Motor Corporation, Dept. RTS, Milwaukee, Wis.*



New features added to . . .

### Motor graders

MORE blade stability, easy moldboard-tilt arrangement and full-sweep visibility have been incorporated in the LeTourneau-Westinghouse line of Adams motor graders. Also featured are a new circle size, enclosed ball-socket lift-link caps and a new 6-cylinder engine for three models.

Size of the circle has been increased to 63 in, 9 in more than formerly. This is to provide greater blade stability permitting the operator to do a more efficient job of finish grading.

Full-sweep visibility is said to be provided by relocation of the lift housing box-beam support which was formerly on top of the frame. The support is now welded through the frame and opens up the top completely to give the operator excellent visibility ahead of the machine. An average operator's vision is claimed to be increased to 10 to 15 ft closer to the front of the machine.

The new moldboard-tilt adjustment is said to permit adjustment to be made in as little as 15 min, since only one nut need be loosened on each circle leg. Another feature is the new universal moldboard mounting which is claimed to simplify the field installation of power-shift or slide-shift moldboards when interchangeability is desired.

Lift arms and lift links are now equipped with enclosed ball-socket caps instead of the open type. This is said to give smoother-operating, longer-wearing parts, since they are kept cleaner and lubricated more completely.

A new 6-cylinder, 4-cycle, Cummings C-160-B1 engine is available for use with the 440, 550 and Power-Flow 550 models. The GM 4-71, 2-cycle engine is also available for these models. All engines are rubber-mounted to minimize vibration.

LW motor graders are available in seven models from 60 to 190 hp. Torque converters are available in the 660 and 550 series machines. A full line of optional equipment and accessories is also available for use with all models. *LeTourneau-Westinghouse, Dept. 085-RTS, Peoria, Ill.*



Automatic spark adjuster on . . .

### Air-cooled engine

INTRODUCTION of a new model in the Kohler series of engines is said to provide a range of engines to meet all requirements from 3 to 24 hp. The new model, K-241, develops 9.5 hp at 3600 rpm. The engine is said to be easy to start due to a spark-advance mechanism which automatically retards the spark during starting and advances it when speed is increased. It is claimed that the cooling system of the new engine directs a sufficient volume of cool air to maintain correct operating temperatures at all times. Anti-friction bearings are used at both ends of the crankshaft. Standard equipment on the new engine includes a heavy-duty silencer-type muffler, oil-bathed air cleaner and a rotating chaff screen. *Kohler Company, Dept. RTS, Kohler, Wis.*

Rust penetrated by . . .

### Metal primer

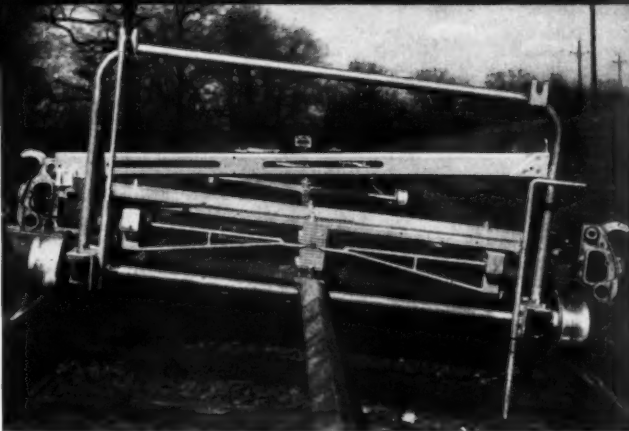
SPECIFICALLY formulated for use over rusted and damp metal surfaces the new Sherwin-Williams Metalastic primer is de-

(Continued on page 62)



# NORDBERG PRESENTS THE NEW "MIDGET" SURFACER

(Above): New Nordberg "Midget" Surfacers in use, with the 4-wheel carriage and the three 2-wheel buggies connected by coupling tubes, around which the wire is stretched. (Below): Carriage on a curve and pointers on "zero". Note hand jacks on platforms and one of the two retaining brakes being used to hold the "Midget" on a grade.



## WIRE REPLACES HUMAN JUDGMENT AND ELIMINATES VISUAL ERRORS

... here's what the "Midget" Surfacers does:

- Smoothin' ... locates and corrects irregular surface.
- Locates and corrects minor surface irregularities after jacking and before tamping in a track raising operation.
- Locates and corrects settlement irregularities following ballasting of high lifts.
- Analyzes the quality of track surface.

The new Nordberg "Midget" Surfacers eliminates human error and guesswork by utilizing a 50-ft. length of tautly drawn wire over each rail to locate and correct low spots in track surface. It is made up of a 4-wheel carriage and three 2-wheel buggies. Two pointers are employed, one for each rail. One end of each pointer is in constant contact with its wire, and the other end moves over a graduated scale which is mounted on the carriage over the center of the track.

As the lightweight "Midget" is pushed along the track, the two pointers are observed. If the surface

is perfect, these pointers will constantly indicate "zero" on the pointer scale. As low spots are encountered in either rail, the individual pointer will move below "zero". In this way, each rail is analyzed independently of the other.

When a low spot is found, the "Midget" is moved back and forth to locate the lowest point, and a hand jack is then inserted at this spot and used to lift the track until the pointer reading is corrected. A tie adjacent to the hand jack is tamped manually to hold this correction. Suitable tamping means are then employed to tamp all ties at the corrected spot.

Write for complete information.



# NORDBERG

*Mechanical Muscles®*



**NORDBERG MFG. CO.**

**Milwaukee 1, Wisconsin**

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PHOTO

## Device for warning trackmen

What is the most effective device or method for giving warning of approaching trains to operators and men working with noisy machines?

### Whistles or sirens

By ROADMASTER

Any device used for warning trackmen and operators of track machines of approaching trains is a safety device. As such, it must be effective. If it is not, it can be harmful because the men will be depending upon it for a protection which isn't there.

It is not enough to expect the yells of watchmen or of foremen to alert the men of the impending approach of trains. The human voice can hardly be made to predominate over the noise of machines. A person would become hoarse very quickly if he tried to do this.

Bells are not effective enough to use for this purpose either. This is easily illustrated by two boxers fighting in a ring. On many occasions the fighters will keep on fighting after the end-of-the-round bell has sounded. This demonstrates how two men—not just one—have both missed the sound of the bell because of their engrossment in their work. Operators

of machines also become oblivious to their surroundings through intense concentration to their work. So a bell is hardly the type of warning device for them.

A whistle will dominate a bell. For this reason most track gangs are protected by whistles. These may be blown by the watchman or by air supplied by the machine. Where air is not available, an electric siren can be used. Both the whistle and the siren can be made to produce sounds which demand the hearer's attention. This is what we want.

### Flags and whistles

By T. A. BONELLI  
Trackman  
New Haven  
New London, Conn.

The most effective method used for giving warning of approaching trains is the hand white-flag method. Any other mechanical devices used

to warn of approaching trains should be discarded.

When there is a large force deployed in track maintenance where machinery is involved, a minimum number of hand-picked men should be placed on curves to insure the full protection of the gang and equipment. These flagmen shall be supplied with large white flags. The distance between flagmen shall be governed by the ability of one to see the other at all times.

When there is reason for the farthest flagman to wave his white flag because of an approaching train, the signal shall be relayed by the flagman in between to a whistle man. The latter shall be stationed at all times with a group of man-operated machines. Each group of man-operated machines shall have its own whistle man.

Whistle men shall blow their whistles and in addition wave their white flags to give warning that a train is approaching. This whole procedure should take only a matter of seconds. When the train has come in view and is passing by, each operator shall cease to operate his machine and must wait for instructions from the whistle man or other supervision before starting to work again.

When there is a long length of tan-

## NEW QUESTIONS to be answered in October

Do you have an answer to any of the questions listed below? If so, send it in. Payment—based upon substance and length—will be made for each published answer. If you'd prefer that your name be withheld, we'll gladly comply.

DEADLINE: August 31

● 1. When surfacing track, what factors determine the spacing and location of the jacking points? Explain. Is the weight of rail a factor?

● 2. What are the advantages, if any, in prestressing precast concrete piles? Disadvantages? Explain.

● 3. When relaying rail, is it more economical for the rail gang to pick up recovered spikes, anchors, bolts, nuts and plates and place in separate piles for later loading, or should this be done by another force? Explain. Should the recovered material be sorted on the ground between usable and scrap? Why?

● 4. To what extent should railroads engage outside architects to design or redesign large facilities? What are the advantages and disadvantages? Explain.

● 5. How does a foreman determine that he is unloading the proper amount

of ballast to make a specified track raise? Say one inch? Four inches? Six inches? What methods are used to assure the required amount is unloaded uniformly? Explain.

Send answers to:

**What's the Answer Editor**  
**Railway Track & Structures**  
**79 West Monroe Street**  
**Chicago 3, Illinois**

Do you have a question you'd like to have answered in these columns? If so, please send it in.

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STRUCTURES



## For Bridge Construction and Re-construction **HERE'S A BETTER WAY TO BUILD**

Bridge construction with Armco Corrugated Metal Drainage Structures offers three advantages you can measure. Consider these facts: Bridging a stream or ravine with an Armco Structure plus an embankment saves money. The "bridge" is mostly earth! Secondly, it saves time. Modern earth-moving methods make short work of

backfill. Third, maintenance is practically eliminated. Compared with a trestle, there is very little to maintain. Write us for authoritative data or assistance with your construction problem. Armco Drainage & Metal Products, Inc., 4379 Curtis Street, Middletown, Ohio. In Canada: write Guelph, Ontario.



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HiLoader cleans full width of tie, stockpiles faster than two end loaders.

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5631 West 65th Street  
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**HiLOADER  
TRACK  
CLEANER**

**Athey's 18TC HiLoader Track Cleaner unloads drop-end gondola cars even while train is moving!** Only 102" wide, the 18TC easily fits in, empties car from end to end. Casting distance is 19½ feet with the 18 foot swiveling conveyor. On the ground the Track Cleaner loads 15'7" high to fill the highest hopper cars—at rates up to 10 cu. yds. per minute! Stock pile loading, track cleaning and snow removal are some of the other jobs the Athey 18TC Track Cleaner performs at record rates.

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for booklet "Athey HiLoader Track Cleaner." See how you can save money with this versatile fast-working unit.



**Designers and Manufacturers of Heavy-Duty  
Loading and Hauling Equipment**

## What's the answer? (cont'd)

gent track and the view is not obscured the men with the white flags shall be eliminated and only the whistle men should be retained. The whistle man must look both ways for approaching trains. He must not make unnecessary conversation and should not have any other duties other than his important assignment.

## Annual inspection of buildings

When making an annual inspection of buildings, what specific features of the structures should always be investigated or examined closely? Why?

### Look at the roof

By E. J. HYNES  
Assistant Engineer Bridges & Buildings  
Detroit, Toledo & Ironton  
Dearborn, Mich.

The part of a building which is most likely to be overlooked during an annual building inspection, and which is very likely to be a troublesome and expensive maintenance problem, is the roof.

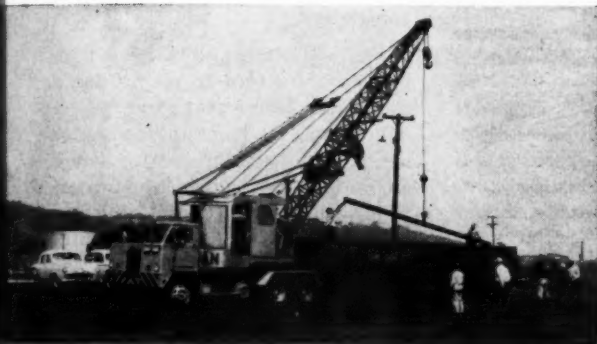
A roof of good quality material properly applied, should give satisfactory performance at least as long as the guarantee or bond period. It will usually do so provided the supporting structure and roof appurtenances do their job properly. Too often, roofing is blamed solely for a failure which in reality was caused by forces for which the roofing was not designed or intended to combat.

For example, clogged or damaged gutters or downspouts can cause tears or breaks in the roofing by twisting gravel stops out of their normal position. When this happens, insulation becomes wet, loses its bond and causes blisters, which rupture very easily. As often happens, the apparent roofing failure can occur at a point relatively distant from the real cause.

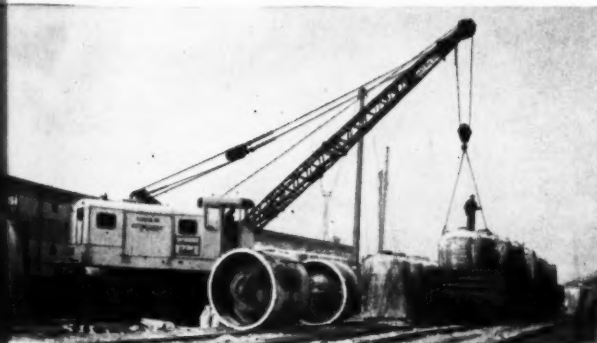
Eave troughs, which are sagged and



**MAGNET:** Scrap work. AMERICAN DiesElectric Locomotive Crane.



**LOADING:** Rail handling. AMERICAN 300 Series Truck Crane.



**SPOTTING:** Cars and materials. AMERICAN DiesElectric Locomotive Crane.

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to 2 yds.-60 tons  
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Special materials  
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Drop forged fittings  
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**YARD MAINTENANCE:** Pipeline Trenching. AMERICAN 100 Series Crawler Crane.

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# NEW BANTAM RAIL-ROADER

(Patent Pending)

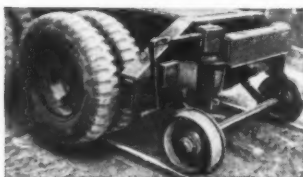


## Makes every job quickly accessible, on track or off!

The new BANTAM Rail-Roader is up in size—offering more capacity. It's more flexible—offering increased work range and convenience. This *single* machine gives new all-around job coverage—on track and off.

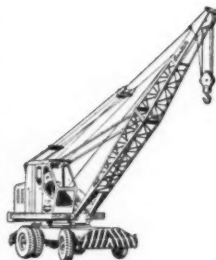
Every job is quickly accessible with the BANTAM Rail-Roader. It travels permit-free over the highways, spots itself on the rails, moves in either direction. Because of BANTAM's true mobility, fast work cycles, easy operation and balanced design, it finishes the job far more quickly than less versatile rigs.

The BANTAM Rail-Roader is built in two models: 8-ton-capacity, carrier mounted unit and a self-propelled version of 11-ton capacity. Both give top performance on and off the track. Both convert, on the spot, for any job need with 11 BANTAM-built attachments. Handle bridge construction and maintenance, track laying and replacement, backfilling bridge ends, placing ballast and yard materials—or any of the hundreds of B&B and maintenance-of-way jobs.



**NEW COLOR MOVIE AVAILABLE**  
See new color film of the BANTAM Rail-Roader in action — on jobs like yours — pointing up the big savings you can make. Use coupon.

BANTAM's uniquely dolly wheel design provides safe, rapid on-track travel and work. Fast-retract feature gives you off-track service to duplicate BANTAM's rapid mobility and job coverage. Moves on or off track in minutes at any grade crossing.



BANTAM CR-350 self-propelled Rail-Roader  
—11-ton capacity

WORLD'S LARGEST  
PRODUCER OF TRUCK  
CRANE-EXCAVATORS



**SCHIELD Bantam Co.**

SCHIELD BANTAM COMPANY 284 Park Street, Waverly, Iowa

RT-242

I want: ... literature on BANTAM Rail-Roader. Also { } Carrier mounted  
... to see Rail-Roader movie. { } Self-propelled

Name..... Title.....

Railroad.....

Address.....

City..... Zone..... State.....

## What's the answer? (cont'd)

no longer retain their proper slope, can hold water and ice and thus put undue stress on the edges of the roofing material with the same result.

There are appurtenances too numerous to mention here, which contribute to roofing failures, such as flashings, ridge caps, flues, vents, ventilators, etc., which should be checked for proper alignment and general condition. Keeping these things in a proper state of repair may extend the life of the roof covering itself for many years, and save thousands of dollars in untimely renewing of the roofing.

## Examine supports

By H. D. CURIE  
Master Carpenter  
Baltimore & Ohio  
Garrett, Ind.

Special note should be taken to see that the structure is plumb and at proper grade and alignment. Sagging or leaning of a building denotes failure of sills, studding or foundation. Sag in roof also signals future trouble from deteriorated trusses, joints or rafters. Any sags in roof of larger shops or warehouses, where supported by trusses, call for detail inspection of supports for cause. Failure of a roof truss can have serious consequences.

In brick, stone or concrete-block buildings, cracks denote failure of foundation and should be checked for cause and possible correction.

Careful inspection should be made of all joists and floor supports, especially when the floor is out of level as this denotes failure of supports.

In larger structures where posts or pilasters are used for the support of important members, careful check should be made to see that they are sound and in good alignment. Members supporting overhead cranes or tramways should be carefully inspected.

Check undersides of roofs for signs of small leaks. If left uncorrected these will cause serious deterioration of sheathing and roof supports.

Check windows and doors. Badly worn or deteriorated doors can cost considerable money through heat loss.

(Continued on page 48)



Schramm Standard Pneumatractor is a 125 cfm compressor and tractor—allows you to drive your air power where you need it, when you need it. Drives on-track, off-track.



IF YOU WANT TO CONSERVE MANPOWER COSTS:

## Drive your air compressor, don't push it!

Here's the smart, money-saving way to use air compressors on every maintenance-of-way job. With the self-propelled Schramm Pneumatractor, one man drives your air source to the job and along with the work . . . on-track, off-track. Saves valuable time, keeps manpower on the "paying" jobs. With the Pneumatractor, you can operate up to 12 tictampers—simultaneously. You can also use it to power spike or plug drivers, to tow work cars, man-carrying cars, tool-box trailers, or to furnish 125 cfm at 100 psi for any maintenance-of-way job. It's the all-purpose machine, yet it still costs less than most maintenance-of-way portables.

Learn today what other benefits the Pneumatractor can offer you. Write for your free copy of Bulletin RRP-56.

### Schramm, Inc.

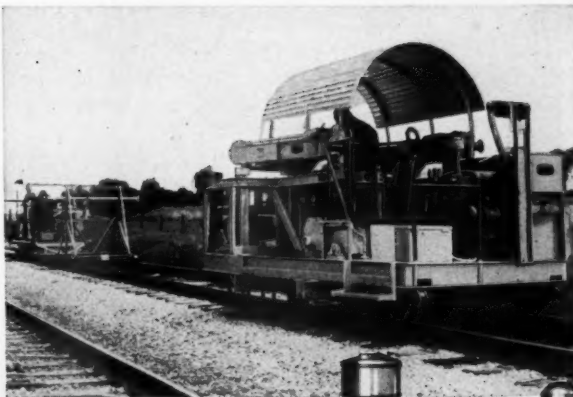
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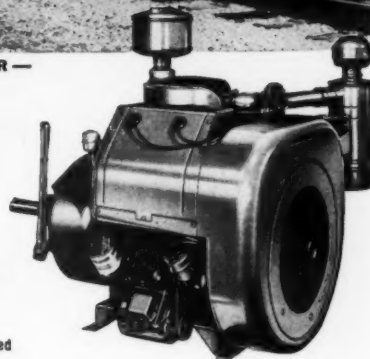
RAILWAY TRACK and STRUCTURES



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include self-cleaning tapered roller bearings; Stellite exhaust valves and inserts; positive valve rotators; gear-pump and splash lubrication, and weather-sealed outside magneto.



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## THE HUSKY 56-HP MODEL VR4D WISCONSIN *Air-Cooled* ENGINE!

Here's the trouble-free drive and muscle your mechanized M/W machines need to pay their way — to stay in ready-to-use condition all year long.

The rugged 56-hp VR4D meets the toughest service demands with power to spare. Its tremendous load-lugging power eases the engine through sudden shock loads without stalling or stopping.

The Model VR4D packs the same power in a smaller and up to 1/3 lighter engine than its water-cooled counter-part. You don't have to worry about dry-ups and freeze-ups, water and anti-freeze, radiators, fan belts, hose lines, etc. And you can depend on fast starts and steady power whether the mercury plummets to below zero or sky-rockets to a stifling 140° F!

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**completely installed \$3,950 PLUS FACTORY FREIGHT**

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#### **What's the answer? (cont'd)**

Check fire protection, stairways and fire escapes. Check for accumulations of trash and obsolete records which always constitute a fire hazard.

Electrical heating and plumbing equipment should be checked for repairs needed. A study might be made to eliminate outmoded or inefficient equipment.

Notes of repairs needed should include sizes of materials, etc., to eliminate extra trips for securing this information when ready to order material.

Another important item to be considered is the possible consolidation of facilities and the elimination of unneeded structures.

## **Hair-line cracks in shotcrete**

What causes the hair-line cracks in shotcrete? What preventive measures can be taken to eliminate such cracks? Explain.

#### **Watch the curing**

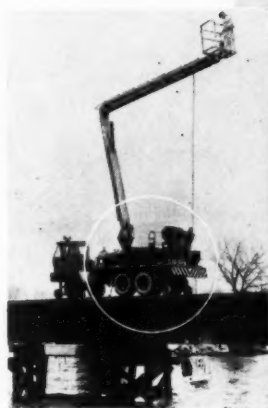
By L. P. NICHOLSON  
Railway Representative  
Portland Cement Association  
Chicago, Ill.

Hair-line or crazing cracks, the narrow fissures which appear in irregular patterns on the surface of shotcrete, usually occur when early moist curing is inadequate. This cracking is caused by differential drying shrinkage during the first few days after application. The outer surfaces shrink more rapidly than the interior, which loses water more slowly. Such early drying shrinkage can be prevented by maintaining a moist concrete surface constantly from the time of shotcreting until the end of the curing period.

Cement particles require water to hydrate and become hardened cement paste. Therefore, concrete, whether used in a large dam or a thin section such as shotcrete, requires moisture to develop its potential strength, vol-

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4. Simplified equipment ... no atomizing air ... allows use of smaller air compressor.



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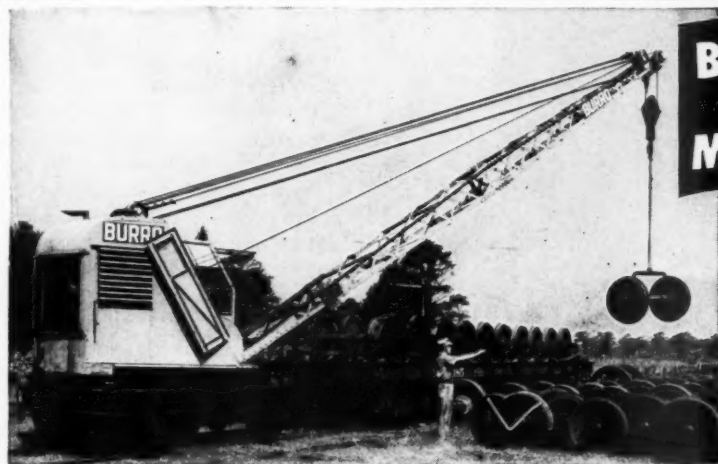
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## What's the answer? (cont'd)

ume stability, durability and other desirable qualities. Inadequately cured concrete may reach only a small fraction of its potential strength.

The American Concrete Institute's "Recommended Practice for the Application of Mortar by Pneumatic Pressure" (ACI 805-51) specifies the following curing procedures:

*"Curing Under Ordinary Temperatures*  
—As soon as the fresh shotcreted surface

shows the first dry patches, a fine spray of water should be applied to keep it moist. After the surface has hardened, it should be kept moist for seven days.

"When the sealing compound method of curing is used, the shotcrete surface should first be sprayed with water; then directly after, two coats of the sealing compound should be applied. If the shotcrete is exposed to the sun, and the sealing compound is black, the application of sealing coat may be followed by one coat of white-wash."

*"Protection From Severe Weather—*  
Extreme heat, especially when accompanied by hot wind, will cause such quick dryout of a thin shotcrete coating that

cracking and separation may be severe. Under such conditions, the shotcrete, immediately upon completion, should be covered with burlap or similar covering, which must be kept continuously moist for 14 days after shotcreting."

As inferred above, curing is most important during the hot, dry summer months because evaporation is most rapid at that time. Even relatively small changes in atmospheric conditions may have a pronounced effect on the rate of evaporation and drying shrinkage.

For example, when relative humidity changes from 90 to 50 per cent, the rate of evaporation is increased about five times. When both concrete and air temperatures increase from 50 to 70 deg. F., evaporation is doubled. The rate of evaporation is about four times greater when the wind velocity increases from zero to 10 mph. If these conditions occurred simultaneously, the rate of evaporation would be increased about 40 fold.

In addition to adequate curing, minor adjustments in the shotcrete mix design and aggregate gradation can reduce the amount of drying shrinkage. The purpose of these adjustments is to reduce the unit water content of the mix since the drying shrinkage of concrete decreases with a decrease in unit water content. Shotcrete is more subject to shrinkage than concrete because its unit water content may be as much as three times that of good concrete. Therefore, any adjustments that can be made to decrease the water content should be made.

One means of reducing the amount of water required is by selecting from available sources the best graded aggregate. The following gradation requirement is recommended by the Gunite Contractors Association:

### Gradation limits for fine aggregate

Sieve Size	Per Cent by Weight
Passing a 3/4 in.	100
Passing a No. 4	97-100
Passing a No. 8	79-85
Passing a No. 16	60-73
Passing a No. 30	36-47
Passing a No. 50	10-20
Passing a No. 100	0-4

Any fine aggregate gradation in which one or two particle sizes greatly predominate should be avoided. Such an aggregate has a large void content and therefore requires a larger unit water content in a mix to give

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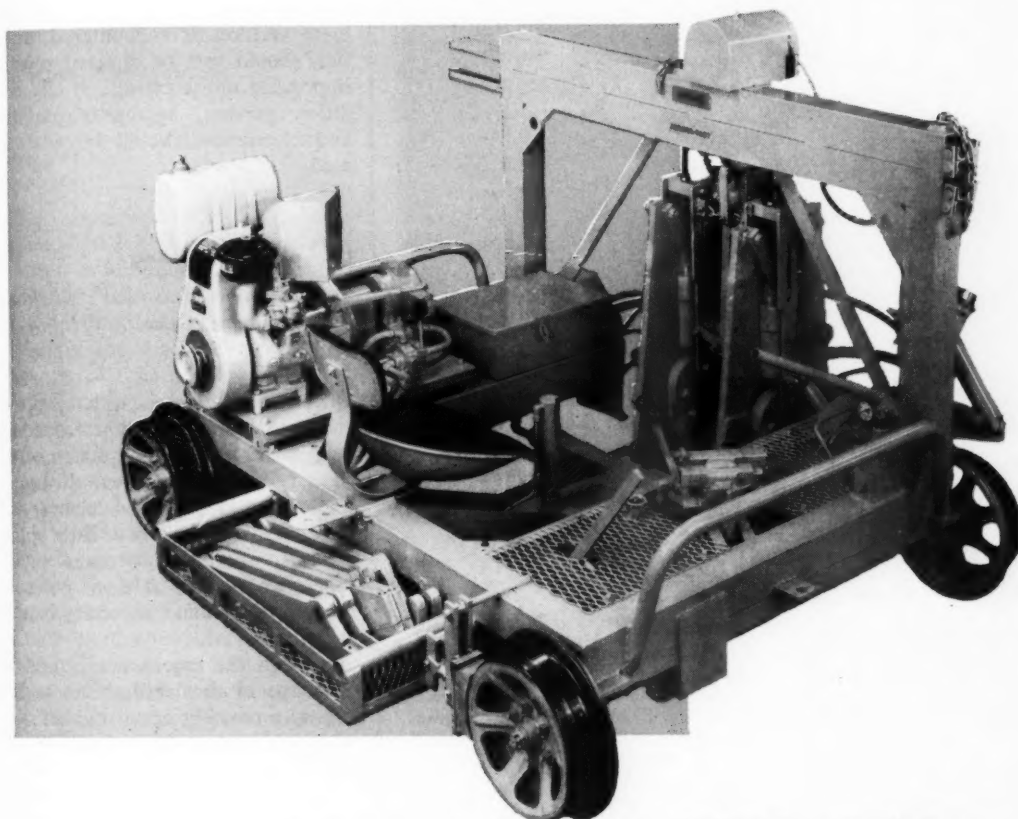
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## For applying ALL TYPES of drive-on or tool applied hang-on anchors

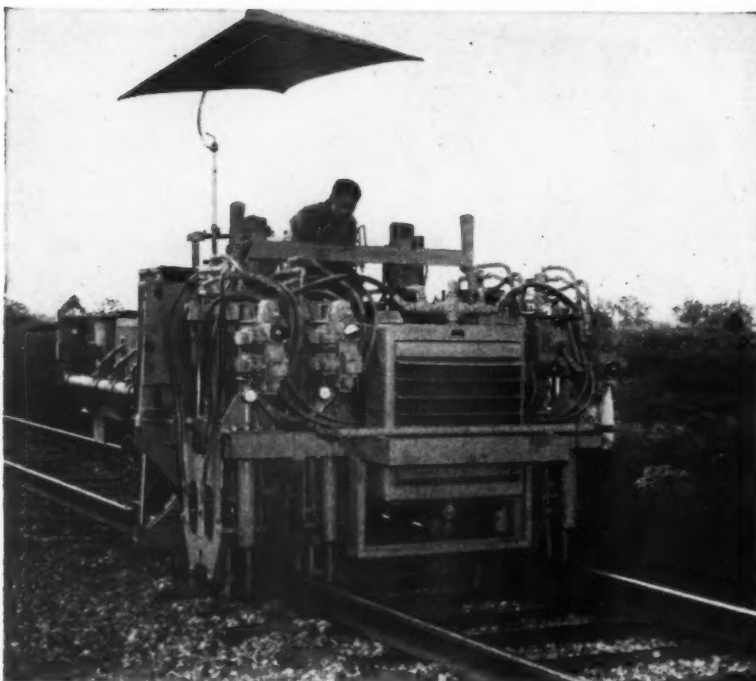
The only machine, of its kind, in the field. The "Anchor-Fast" is hydraulically controlled and self-propelled. Maximum speed 15 mph. Unit is powered by a hydraulic jack cylinder for "off track" movement or can be revolved 180° for work on opposite rail.

### CONSTRUCTION AND OPERATION FEATURES

- Smooth hydraulic pressure with adjustable stops, prevents over driving.
- Positive anchor-to-tie application.
- Machine can be used for either single or box anchoring.
- Powered by a 9.2 hp gas engine with clutch and reduction gear.
- Size of unit—95" x 75" x 56". Wgt. 2300 lbs.



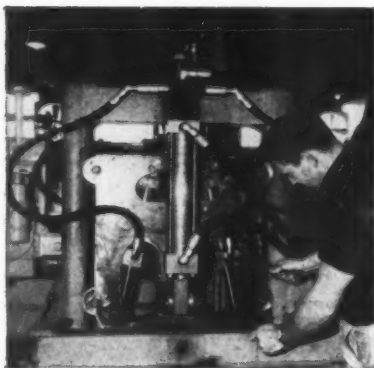
**RACINE HYDRAULICS & MACHINERY, INC.**  
Machinery Division Racine, Wisconsin



Kershaw multiple tamper at work on a section of reconditioned track.

## "Aeroquip Hose Lines are the Best We Can Find for Our Machines"

REPORTS JOHN HOLLEY, CHIEF ENGINEER,  
KERSHAW MANUFACTURING COMPANY, INC.,  
MONTGOMERY, ALABAMA



A workman installing Aeroquip Hose Lines on a Kershaw Super Jack-All. Hose and fittings are assembled quickly in the Kershaw plant.

Labor-saving track maintenance equipment is designed and built by Kershaw Manufacturing Company. Aeroquip Hose Lines with Reusable Fittings are used exclusively on all Kershaw equipment.

"Aeroquip Hose Lines are the best we can find for our machines," says Mr. Holley. "One advantage, we make up hose lines of any length, right in our shop. And, Aeroquip provides excellent hose replacement service throughout the country".

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### What's the answer? (cont'd)

it the same measure of workability.

Clay and other foreign materials in the aggregates can also influence the amount of drying shrinkage in concrete. A recent paper in the ACI Journal points out that drying shrinkage can be reduced one-third to one-half when "borderline" aggregates are cleaned to a degree that is entirely feasible economically.

In conclusion, if crazing of shotcrete surfaces is encountered, attention should first be directed towards improving moist curing. If the condition persists, aggregate gradation and cleanliness should be re-evaluated.

### Use proper backing

By F. A. KEMPE  
Assistant Bridge Engineer  
Northern Pacific  
St. Paul, Minn.

Shotcrete placed with properly anchored mesh against new concrete or against steel backing does not appear to hair crack as extensively as similar material placed against old masonry. While this is of little solace to those who want to cover an old concrete structure, it does point up the fact that sound shotcrete can be obtained.

Perhaps the cracks are caused by shrinkage of the fresh shotcrete setting up a moment about the old concrete so that there is resultant tension in the front face. Perhaps a slower setting concrete like Type II would reduce these stresses and eliminate cracks. Perhaps an additive such as Embeco could eliminate shrinkage to a tolerable figure. AREA specifications in Chapter 8 contain extensive information about how to properly place good shotcrete. Even under these provisions, hair cracks do occur and sometimes even before the shotcrete appears to have set up. Until a foolproof additive is found to eliminate hair cracks, we must follow the spirit of the AREA specifications by properly preparing the surface and shooting a good dry mix. Properly placed reinforcing mesh will assist in keeping the hair cracks from enlarging. Where appearance is important, use of a surface waterproofing will tend to hide the cracks.



## Instruction manuals for machines

What measures can be taken to insure that the manufacturer's instruction manual is read before a man operates a machine? What can be done to insure that these manuals stay with the machines as they are moved about over the railroad?

### Waterproof containers

By H. A. THYNG  
Supervisor Work Equipment  
Boston & Maine  
Boston, Mass.

The manufacturer's instruction manual should be furnished as soon as a firm order for the equipment is received. This would allow the assigned operator time to read the manual before the machine is received. Generally, at time of delivery of any new machine, the operator is trying to absorb as much knowledge about the maintenance as possible as it is related to him by the manufacturer's sales-and-service engineer.

A very desirable feature to have on all machines would be a waterproof container in which to keep the instruction manual. This should be installed by the manufacturer at the factory. Manuals are sometimes expensive to replace and, in addition, incur delay when replacement is necessary. The operator should be charged with the manual and held responsible in case of its loss or misuse.

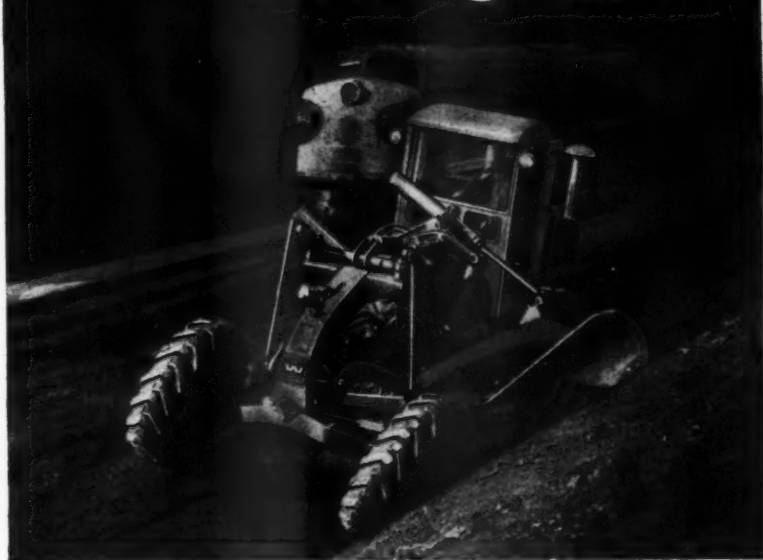
### Built-in compartments

By W. E. KROPP  
Supervisor M/W Equipment  
Lehigh Valley  
Bethlehem, Pa.

Most prospective operators of maintenance machines will read the manufacturers' manual of instructions on the care and operation of such machines if the manuals are readily available. The problem is principally one of having manuals conveniently available and sheltered from the elements. Some of the larger machines have enclosures or compartments built into them by the manufacturers. This is the best arrangement.

The difficulty in keeping manuals

## HUBER-WARCO motor graders



## helps keep traffic running on time

Modern railroads have turned to the use of off-the-track, rubber-mounted equipment for right-of-way maintenance. There is no longer a need to hold up trains, or lose important work-crew man hours while track-mounted equipment is moved to a sometimes distant siding. Huber-Warco MOTOR GRADERS fit right into this new approach. While the Huber-Warco grader performs the necessary grading jobs, trains roll by without delay. An outstanding feature of the Huber-Warco GRADERS is the hydraulic cab-controlled blade movement for bank sloping. In less than a minute, and without ever leaving the cab and without manual adjustments, the operator can change the blade from 90° on one side to 90° on the other. This is just one of the many PLUS features. See your Huber-Warco distributor for details on the complete line of torque converter and standard transmission MOTOR GRADERS ranging from 75 to 195 h.p.

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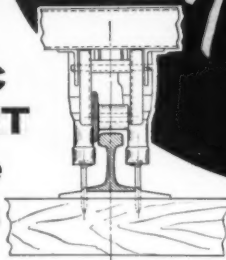


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*More effective now than ever*—SpikeMaster is equipped with a Swinging Gun Mount which automatically adjusts for variations in rail gauge. Air cylinders keep flanged pilot wheels tight to the rail gauge, enabling swinging head to position guns positively over spikes—regardless of curvature or gauge inequalities.

SpikeMaster nips up the tie and drives four spikes—one on either side of both rails.

*Write for New Bulletin SM-200*

**Railway Maintenance Corporation**

PITTSBURGH 30, PA.

#### What's the answer? (cont'd)

with machines increases as the size of the individual machine diminishes. It would require special attachments or enclosures to provide suitable protection on many of the smaller machines if such manuals were to be constantly available.

Increasing costs of all types of machines make it imperative that supervision exert a special effort to have such manuals available in convenient locations. Each new operator then can study them and in addition receive personal instructions from an experienced operator.

Because of the difficulty in providing satisfactory protection for manuals on most maintenance machines and the desirability of providing personalized instructions to new or prospective operators, the supervisor should see that the necessary manuals are provided when the machine is placed in service and accounted for when it leaves his territory.

#### Supervisor's responsibility

By R. S. RADSPINNER  
Supervisor Roadway Machines & Equipment  
Chesapeake & Ohio  
Saginaw, Mich.

The responsibility of providing manufacturers' instruction manuals to machine operators should be placed under the supervisor in charge of work equipment.

One method which can be used to insure that these manuals are read is to have the mechanic maintaining the equipment in each territory go over the manual with the operator of each machine, instructing him on the lubrication, adjustments, servicing and operation.

The supervisor can then test the operator to see how much of the information he has retained. Under some agreements, this can be used, in part, to qualify men as operators for the job. It is desirable that the operator be familiar with the manual material before he is actually assigned as operator on a permanent basis.

The manual must be available to the operator, mechanic and the supervisor before any test can be made. There is no positive method for handling this problem.

When equipment is ordered, the specifications should include a request for copies of all manuals. This request should be reasonable but also cover the needs of the present and replacement of lost or damaged copies in future.

The manual is as important to the operator as his tools and spare parts. A safe, dry place should be provided on the heavy equipment to carry the manual. If spare parts are carried in tool cars or bunk cars, the operator may keep his books there, but this is not as desirable as having them on the machine. When the equipment is moved, it should be up to the supervisor shipping and the one receiving to see that manuals are furnished.

Each mechanic should have his own set of manuals covering all equipment normally in his territory. They should be kept by the mechanic and not used by the operator for his daily requirements.

#### Pass an examination

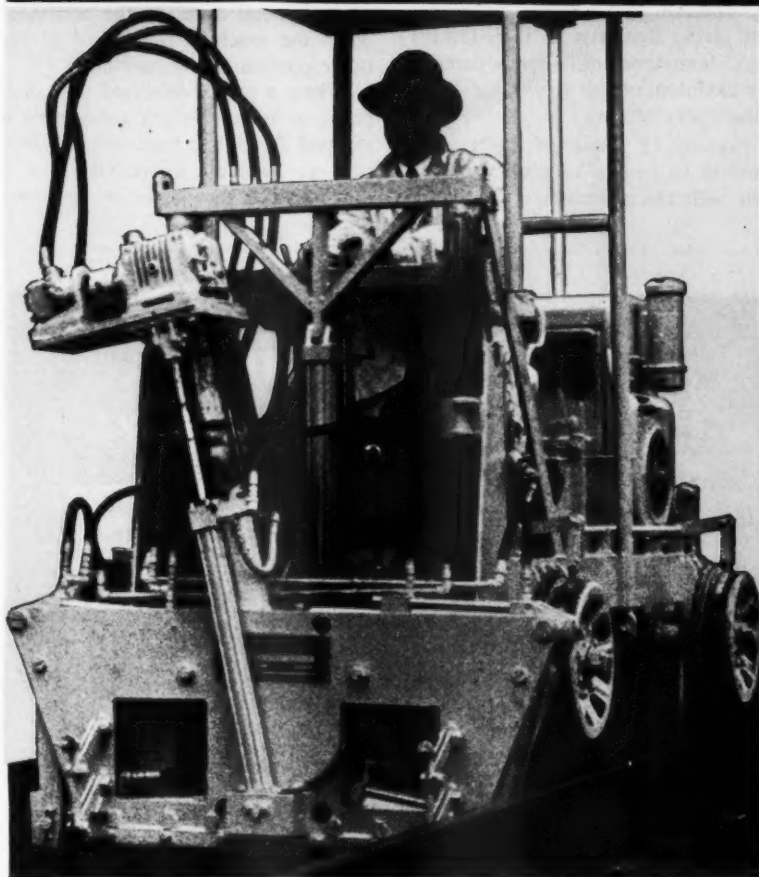
By C. F. MONTAGUE  
Superintendent M/W Equipment  
Pennsylvania  
Philadelphia, Pa.

Machine operators, work-equipment engineers and any others who operate a power-driven tool, roadway machine or item of work equipment should be required to pass an examination to demonstrate their fitness to operate the particular unit of equipment before being allowed to operate it. On our railroad such examinations are usually given by the general foreman-equipment of each district.

This examination covers the prospective operator's knowledge of: (1) the general instructions and particular instructions pertaining to the operation of the specific machine contained in our Manual of Instructions—Maintenance of Way Equipment and the manufacturer's instruction manual; (2) the safety rules and, in electrified territory, the special instructions pertaining to such territories; and (3) Letters of General Practice (if any) pertaining to the tool, machine or piece of equipment involved. The employee must also demonstrate in actual operation his ability with the particular machine or equipment.

Upon successfully passing such an examination the operator is issued a card signed by the examiner certifying as to his fitness to operate the

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Using only an operator and one man for sighting, LineMaster provides outstanding maintenance economies. With lining head anchored to roadbed by a power-driven spud inserted in the crib, hydraulic cylinders under precise control of the operator move track in either direction. Available in wheel-mounted and crawler-mounted types.

Railway Maintenance Corporation

BOX 1888, PITTSBURGH 30, PA.



## What's the answer? (cont'd)

designated unit. Another card for the railroad's file is prepared. It shows the date he passed each part of the examination and is signed by the person giving that part of the examination. Sometimes different portions of the examination are given by different supervisory officers.

Frankly, I know of no positive method to insure keeping the manuals with the machines. This matter

gives us considerable trouble. Our instructions to all concerned are that the manufacturer's instructional manual is to be kept with the machine at all times and is to accompany it when transferred, or it is to be mailed under special cover to the consignee when the machine is shipped to another portion of the railroad.

When a power-operated tool, machine or item of work equipment is shipped from one supervisor's territory to another, a special form is made out by the officer or employee

shipping it. The form calls for information on the railroad's machinery record number; the manufacturer's serial number; the kind of equipment; how moved and railroad car number, if involved; where it is being shipped from; who consigned it and the destination. One line on this form reads, "Instruction book and parts list were . . . with machine," the next line reads, "Instruction book and parts list have been ordered from manufacturer and will be forwarded to . . ."

Copies of this report are forwarded to the regional engineer and district engineer. The person making the shipment is required to fill out the form indicating whether the instruction book and parts list (manufacturer's instruction manual) are being shipped with the machine. If not, he is to order them from the manufacturer and forward to the consignee as soon as received.

The policing of these requirements is very difficult.

One suggestion which might help is to see that each machine has a covered compartment or drawer to contain the manual and protect it from the weather. On some of the smaller machines this is not practical. But our experience shows that where such a place is provided the manuals are not lost as frequently.

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### PROJECT:

Interstate Highway Construction, Houston, Texas.

### CONTRACTOR:

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## Flanged wheels on trucks

On what types of trucks and for what purposes is it advantageous to mount flanged-wheel attachments? Why? Are there any limitations governing the operation of such equipment? Explain.

### Requires train crews

By T. S. BEAN

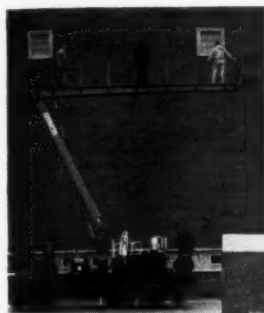
General Superintendent M/W Equip.  
Southern Pacific  
San Francisco, Calif.

I must first explain that though we have a substantial fleet of trucks (about 1700 in number) and use them for most purposes, we do not have any equipped with flanged

# Only **STRATO-TOWER** completes overhead jobs... in less time at far less cost!

## What **STRATO-TOWER** can do for you...

Strato-Tower eliminates the necessity of scaffolding, for it is its own scaffold. Cost of reaching hard-to-get places is greatly reduced. Cost-wise Strato-Tower will work more area, lift more weight, and work over more terrain than any machine on the market today. Strato-Tower will make otherwise "troublesome" jobs routine accomplishments in bridge inspection and maintenance, tuckpointing, painting, fire fighting, pole installation, rescue work, and overhead wiring.



Strato-Tower catwalk. Ideal for overhead bridge and building maintenance. Truck equipped with paint spraying apparatus.

Strato-Tower (TST-45) 50-foot working height. Building in background is 51 feet high.



On- and/or off-track equipment and Strato-Tower. This combination will work above or below grade, on or off rails. Miles of trestle can be inspected in one day.



Strato-Tower teamed with spider staging. Spider stage powered by Grayco compressor. Combination can inspect area 50 feet on each side of trestle by 200 feet below road bed.

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Sufficient stability is provided to permit unrestricted operation when safe gross vehicle weight is maintained.

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- Operator may mount and dismount at ground level.
- Constant-levellled personnel platform at end of double jointed boom gives 24 inch by 48 inch stable working area.
- Controlled by platform operator. One hand control gives quick positive movement in right direction.
- May be mounted on almost any truck, flat car, truck trailer, or industrial truck so long as gross vehicle weight is maintained.
- Booms and outriggers are hydraulically operated.
- Exclusive Hydra Trunk permits use of small vehicles and allows quick attachment and removal from supporting vehicles. (Pats. pend.)
- Independent power source adds to versatility.
- Some models are mobile when booms are extended in any working position.

Strato-Tower is nationally distributed by **SOUTH EASTERN RAILWAY SUPPLY CO.,** Arlington, Virginia

**STRATO-TOWER DIVISION**  
**YOUNG SPRING & WIRE CORP.**

Post Box 103

Phone Jackson 2-1870

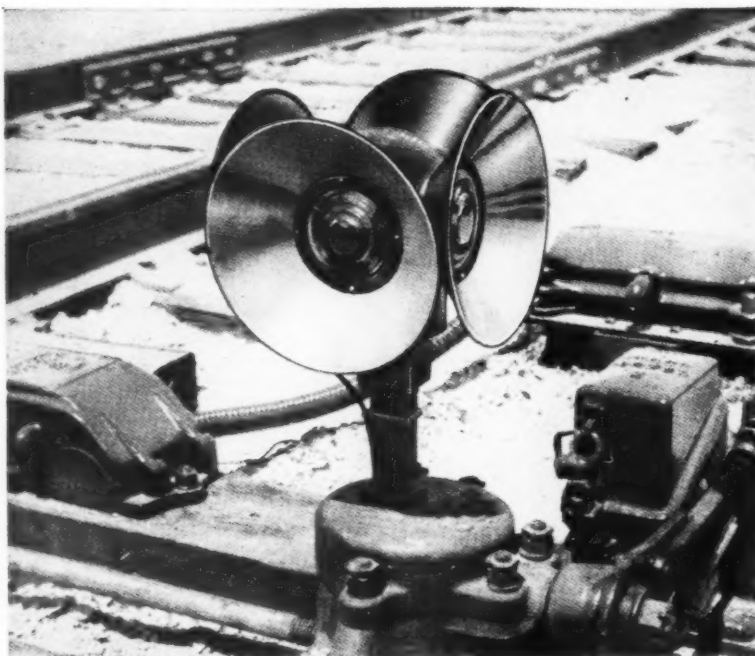
Elkhart, Indiana

## What's the answer? (cont'd)

wheels. There are probably many reasons for this—the prime reason being the operating agreements that make it prohibitive to pay for the additional train crew when using such a unit. Since this is a deterrent, and also because work time is lost waiting for the track time to use such equipment, we are following the policy of constructing and extending roads parallel to our tracks.

On such roads, men, materials, and equipment are transported to and from the job site at will. Pneumatic-tired cranes, compressors, tractors and van-type tool trailers are but some of the equipment we are using on the highway together with tilt-trailers of sufficient size to transport our heaviest crawler and flanged-wheel types of equipment.

At present there does not appear to be any advantage to equip our trucks or other units with flange attachments.



## WRRS ELECTRIC SWITCH LAMPS REDUCE SWITCH LIGHTING COSTS 50%

That's an amazing claim... but it's true! You can replace old-fashioned, flickering oil switch lamps with modern, dependable WRRS Electric Switch Lamps which will **pay for themselves in two years**... AND continue to save money year after year. Complete package units for operation with primary battery or with commercial current are available. When you change over to WRRS Electric Switch Lamps you get steady, clear light... 400% brighter than oil lamp light. That's just one of the great many advantages WRRS Electric Switch Lamps offer. Write for complete details.



### WESTERN RAILROAD SUPPLY COMPANY

Division of Western Industries, Inc.

2742 West 36th Place, Chicago 32, Illinois

In Canada: Melville Machinery Co., Ltd., 515 Bisson Street, Montreal 3, Quebec

## Biographical briefs

(Continued from page 10)

Mr. Forman entered the service of the Louisville & Nashville in 1920 as an instrumentman at Ravenna, Ky. He was appointed draftsman at Louisville in 1927 and two years later was promoted to assistant engineer at that location, later serving in this capacity at Middlesboro, Ky. Mr. Forman subsequently served as assistant engineer in the chief engineer's office at Louisville, assistant division engineer at Middlesboro and division engineer at Ravenna. He was promoted to special engineer at Louisville in 1945 and to assistant chief engineer in 1951. Five years later he was advanced to chief engineer, the position he held at the time of his recent promotion.

**Joseph L. Cox**, 65, who recently retired as district engineer on the New York Central at New York City (*RT&S*, May, p. 10), was born at Streator, Ill. He began his railroad career in 1917 with the Chicago, Indiana & Southern (now part of the New York Central System). In 1925 Mr. Cox was appointed draftsman on the New York Central at Chicago, being promoted to junior engineer two years later. He was advanced to assistant supervisor track at Elkhart, Ind., in 1929 and to assistant engineer at Chicago four years later. Mr. Cox served in this capacity at both Cleveland, Ohio, and New York prior to being promoted to division engineer at Erie, Pa., in 1943. He was advanced to assistant district engineer at Cleveland in 1953 and to district engineer at New York the following year, the position he held at the time of his recent retirement.

**George R. Vanderpool**, 55, who was recently promoted to bridge engineer, Western Lines, Santa Fe, at Amarillo, Tex. (*RT&S*, May, p. 10), was born at Woodward, Okla. Mr. Vanderpool studied at Kansas State College for two years, until June 1926, at which time he entered the service of the Frisco as a chainman at Enid, Okla. In September of that year he left the Frisco and joined the Santa Fe in the same capacity at Wellington, Kan. Two years later he returned to Kansas State College, graduating in 1930 with a Bachelor of Science degree in civil engineering. At this time he returned to the Santa Fe, being appointed rodman at Clovis, N.M. After serving in this capacity for two years he left the Santa Fe and entered the service of the Kansas Highway Commission serving in various positions until 1936. At this time he returned



G. R. Vanderpool  
Santa Fe



Joseph L. Cox  
NYC



# G A U T I E R T H E I M P R O V E D R A I L A N C H O R

## STRENGTH DURABILITY ECONOMY

The Improved Gautier is the outstanding Rail Anchor on the market. Heavy, durable and easily applied, it affords long effective service and holds up under repeated applications without additional preparation.

Tough alloy construction with a sure grip and plenty of spring take-up, it can be used again and again on new or old rail.

Efficient, positive application by spike maul, sledge or by machine. It cannot be overdriven.



### MID-WEST FORGING & MANUFACTURING CO.

General Offices: 38 South Dearborn Street, Chicago 3, Illinois

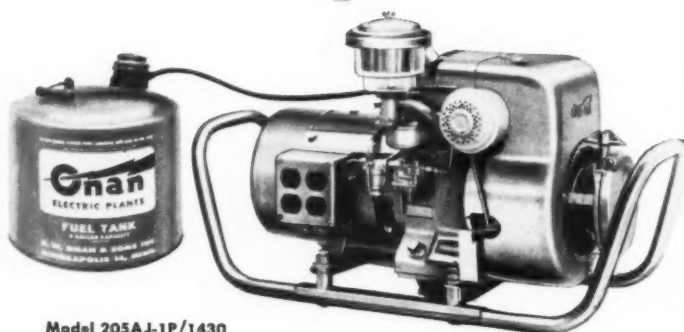
Manufacturing Plant: Chicago Heights, Illinois

Distributors: D. V. MAHER, Cleveland, Ohio; WILLIAM ALLEN, Denver, Colorado; JOHN O'BRIEN, St. Paul, Minnesota; W. T. RICHARDS, San Francisco, California; G. C. HUNT & CO., Atlanta, Georgia





## **NEW!** **Onan portable electric plant with separate 5-gallon fuel tank!**



Model 205AJ-1P/1430

### **Special 2,500-watt contractor's model combines light weight with dependability**

Supplies 2,500-watts A.C. . . . enough for a crew of three men using electric tools . . . yet it weighs only 140 pounds!

New separate fuel tank holds  $2\frac{1}{2}$  times as much as regular mounted tank, saves refueling time. Fuel line is quickly detachable. You can move the plant without carrying along heavy fuel.

#### **Ruggedly-built . . . quick starting**

Powered by a dependable Onan 4-cycle, single-cylinder, air-cooled engine. Drip-proof, all-weather Onan generator is directly connected making a compact, rigid, smooth-running power package. No belts or couplings to cause trouble. Aluminum carrying frame, 4 plug-in outlet box, recoil starter and separate fuel tank are standard. Choice of 115, 230, or 115/230 voltages.

Many more models — 500 to 200,000 watts. Call the Onan distributor listed in your phone book or write —

**D. W. ONAN & SONS INC.**

ELECTRIC PLANTS, GENERATORS, ENGINES, ENGINE-COMPRESSORS  
3385 University Avenue S. E., Minneapolis 14, Minnesota



#### **Biographical briefs (cont'd)**

to the Santa Fe and was appointed masonry inspector at Amarillo, subsequently serving as chainman and rodman at Wellington and Clovis, draftsman at Amarillo and transitman-inspector at Clovis. Mr. Vanderpool was promoted to assistant engineer at Amarillo in 1943 and further advanced to assistant office engineer there in 1958, the position he held at the time of his recent promotion.

**Herbert F. Longhelt**, 35, who was recently promoted to division engineer on the Illinois Central at Waterloo, Iowa (RT&S, Apr., p. 10), was born at Chicago Heights, Ill., and graduated from the University of Illinois in 1947 with a Bachelor of Science degree in civil engineering. Mr. Longhelt entered the service of the Illinois Central in 1947 as an engineering aide at Carbondale, Ill. He was promoted to assistant supervisor there in 1949 and further promoted to supervisor track at the same location in 1951. In 1954 he was transferred to Bloomington, Ind., and two years later was promoted to assistant to division engineer at New Orleans, La., the position he held at the time of his recent promotion.

**James P. Ray**, 70, who recently retired as regional engineer on the Baltimore & Ohio at Cincinnati, Ohio (RT&S, May, p. 10), was born at Baltimore, Md., and received his higher education at Lehigh University. Mr. Ray entered the service of the B&O in 1910 as a chainman at Baltimore, being promoted to levelman at Cincinnati the following year. All of his subsequent service was at this location and included promotions to draftsman in 1915, field engineer in 1916 and assistant engineer in 1920. In 1941 he was further advanced to district engineer. Mr. Ray was promoted to regional engineer the following year, the position he held at the time of his recent retirement.

**Bryce F. Keays**, 39, who was recently promoted to budget officer of the Atlantic region of the Canadian National at Moncton, N. B. (RT&S, Apr., p. 10), was born at Matapedia, Que., and graduated from the University of New Brunswick in 1942 with a Bachelor of Science degree in civil engineering. Mr. Keays entered the service of Canadian National as an instrumentman at Campbellton, N. B., in 1943 and was later transferred to Edmundston. He was promoted to assistant division engineer at Moncton, N. B., in 1947 and further promoted to division engineer at New Glasgow, N. S., in 1950. Mr. Keays was serving in this capacity at Moncton at the time of his recent promotion.

**William R. Jacobs**, 33, who was recently promoted to assistant to superintendent maintenance equipment on the Southern at Charlotte, N. C. (RT&S, April, p. 10), was born at Selma, N. C., and graduated from the Virginia Polytechnic Institute in 1951 with a Bachelor of Science degree in mechanical engineering. Mr. Jacobs entered the service of the Southern in May 1952 as a special apprentice at Knoxville, Tenn. In October of that year he was promoted to assistant supervisor work equipment there. The following year he was further promoted



**George L. Field**  
CNR



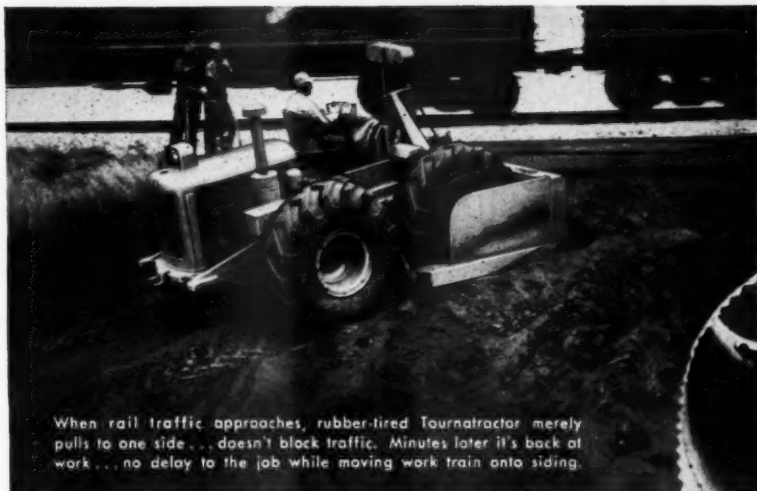
**K. E. Wyckoff**  
GN

to supervisor work equipment at the same location. He was appointed assistant engineer at Charlotte, N. C., in October 1953, and to assistant to shop superintendent at the Charlotte roadway shop in 1956. The following year Mr. Jacobs was promoted to assistant shop superintendent, the position he held at the time of his recent promotion to assistant to superintendent maintenance equipment.

**George L. Field**, 45, who was recently promoted to general maintenance inspector of the Canadian National at Montreal, Que. (*RT&S*, May, p. 10), was born at Montreal. He entered railway service with the Canadian National in 1936 as a rodman at Montreal, subsequently being promoted to instrumentman. In 1942 he was promoted to assistant engineer at Ottawa, Ont., being transferred to Toronto, Ont., three years later. Mr. Field was further advanced to division engineer at Capreol, Ont., in 1946. He was serving in this capacity at Montreal at the time of his recent promotion.

**J. E. Freeman**, 43, who was recently promoted to district bridge and building supervisor on the Rock Island at Des Moines, Iowa (*RT&S*, Mar., p. 10), was born at Griswold, Iowa. He entered the service of the Rock Island in 1936 and the following year became a helper in the system steel erection gang, advancing to riveter in 1938. Mr. Freeman was in military service from December 1944 to July 1946, after which he returned to the steel bridge gang, becoming crane operator the following year. He was promoted to assistant foreman of the steel bridge gang in November 1947 and to foreman in September 1949. In April 1957 he was further promoted to master carpenter, the position he held at the time of his recent promotion.

**Kenneth E. Wyckoff**, 44, who was recently promoted to assistant to chief engineer of the Great Northern at St. Paul, Minn., (*RT&S*, May, p. 10), was born at Spokane, Wash., and graduated from the University of Washington with a Bachelor of Science degree in civil engineering. He entered the service of the Great Northern in 1940 as a chainman at Spokane, serving subsequently as rodman and instrumentman at various locations. In 1954 he was promoted to division engineer at Spokane, serving in this capacity there on both the Spokane division and the Kalispell division. Two years later Mr. Wyckoff was further promoted to office engineer at Seattle, Wash., the position he held at the time of his recent promotion.



When rail traffic approaches, rubber-tired Tournatractor merely pulls to one side... doesn't block traffic. Minutes later it's back at work... no delay to the job while moving work train onto siding.

## How to handle scattered RR maintenance jobs **FASTER... CHEAPER**

**H**andle your scattered RR maintenance jobs faster... more economically... with only one man and a high-speed, rubber-tired Tournatractor®. This versatile LeTourneau-Westinghouse tractor travels the *quickest* route to any assignment — at speeds to 17 mph — over tracks, roads, cross-country, or right-of-ways. Big, low-pressure tires flex harmlessly over obstacles... do not damage rails, switches, or ties.

### **Makes right-of-way repairs before damage gets serious**

218 hp Tournatractor handles your right-of-way maintenance fast... makes repairs before damage becomes serious. Equipped with dozer or Angledozer®, this tractor improves drainage, replaces eroded fills, repairs shoulders, cuts down banks, reinforces causeways and bridge approaches. One man, with a Tournatractor, can keep many miles of your line in tip-top shape for less than it used to cost to repair one major wash-out. Tournatractor needs no work train or crews... doesn't delay rail traffic... easily drives off right-of-way at approach of train.

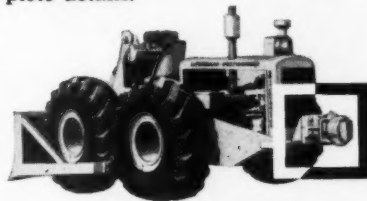
### **Handles variety of jobs**

Tournatractor is also a profitable tool for stockpiling coal, cinders or

ballast. Big, low-pressure tires compact and seal coal piles against spontaneous combustion. This versatile tractor-on-rubber also builds sidings... push-loads scrapers... pulls scrapers, other heavy equipment... plows snow, and spots railroad cars.

### **For complete information**

Why not investigate the high-speed L-W Tournatractor? Its off-track mobility and versatility can make important time and money savings for your line. Call or write for complete details.



### **SwitchTractor\* — a standard**

218 hp Tournatractor, equipped with Type E railway car coupler on the rear — handles scattered switching duties fast. This off-track switcher drives directly across yards, fields, ditches, for quick spotting, grouping of cars. SwitchTractor's big, rubber-tired wheels straddle rails, ride on ballast and tie-ends. Tires give 60 percent coefficient of friction — double the tractive effort of steel-wheeled switchers rolling on smooth, steel rails.

\*Trademark CT-1810-RR-1/2



## **LETOURNEAU-WESTINGHOUSE COMPANY**

Railroad Sales Division  
Peoria, Illinois

A Subsidiary of Westinghouse Air Brake Company  
Where quality is a habit





## HOWARD & GOULD TIE-BORING TWIST DRILLS



These improved HOWARD & GOULD drill bits have in a short time proved to be the best labor and money savers available for field tie boring. A great amount of breakage is eliminated and less drills are used per job.

Four Standard recommended sizes are normally stocked for prompt delivery. Non-standards up to size  $\frac{1}{2}$ " x 12" supplied on short order.

Bulletin on request.

### Howard & Gould Co.

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## Piling Specialists to the Railroads

Rental Steel-Sheet Piling  
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"Faster-from-Foster" service is your assurance of on-time deliveries—anywhere in the country—from Foster's nationwide warehouse and field stocks.

Rail • Switch Material • Track Accessories

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## Products

(Continued from page 40)

signed to serve as a first coat which will add years of extra life to the finish coat. The primer is claimed to penetrate rusted surfaces to create a tight bond with the underlying metal. When applied to damp metal, the primer is said to displace the moisture to provide an ideal surface for recoating. It is stated to be formulated in a way that allows it to work into crevices to insure overall protection for irregularly shaped and rough surfaces. Other features and characteristics claimed for Metalastic Primer are as follows: Lighter in weight than conventional primers; remains flexible in temperatures ranging from 40 deg below zero to 240 deg F; covers solid in one coat, giving the same protection for sharp edges as for flat surfaces; and covers 550 sq ft per gal at a dry film thickness of 2 mil. The paint can be applied by brush, roller or spray. *The Sherwin-Williams Company, Industrial Maintenance Division, Dept. RTS, Cleveland 1, Ohio.*



High-strength arch in . . .

## Backhoe bucket

CONSTRUCTED of manganese steel and cast in one piece the Amsco backhoe bucket is now equipped with a cast attachment arch and Simplex two-part teeth. The tapered design of the bucket and the self-polishing action of the manganese steel are claimed to provide for full loading and fast dumping without heeling. The arch is cast with a box cross-section in order to provide greater strength than that obtained with a normal fabricated arch, it is stated. It is made integral with the main bucket casting by means of shear plugs and fillet welding which are inset to eliminate the possibility of binding when the bucket is working in a trench.

The teeth are equipped with reversible tips that are cast in Amsco's special CS alloy. The tips are replaced by knocking out a retaining pin, removing the old tip and inserting a new one. Adapters, made of the same alloy, are available for fitting the tips to any backhoe. A wide selection of interchangeable side cutters is also available for use with all buckets. *American Manganese Steel Division, American Brake Shoe Company, Dept. RTS, 389 East 14th St., Chicago Heights, Ill.*

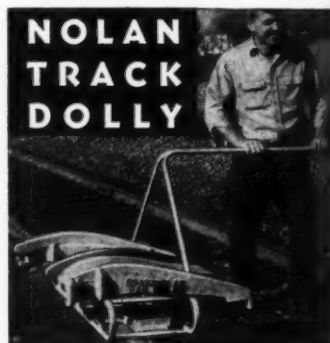


Cushion impact with . . .

## Marine dock bumpers

THE IMPACT of boats and ice can be cushioned by using a new line of marine dock bumpers. Designed for maximum protection of boats, piers and docks, the bumpers consist of a heavy-steel frame to which is fastened wear-resistant, laminated segments of rubber-reinforced fabric. They are available 8 in deep with a 12-in face, with lengths furnished according to specification. *Bumpers, Inc., Dept. RTS, 2534 Detroit Ave., Cleveland 13, Ohio.*

## NOLAN TRACK DOLLY



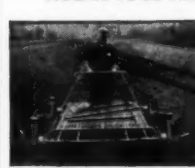
You can get rails, ties, supplies, tools, rerails, etc., to the job with money-saving speed and efficiency, when you equip your crews with the Nolan Track Dolly.

Built of tubular high-carbon steel. Extremely strong and serviceable. Operator's handle conveniently placed to assure correct balance and full control of heavy loads.

STANDARD DOLLY		Ht. Above Rail	Weight
Length 50½ in.	Width 15½ in.	6½ in.	88 lbs.

INSPECTOR'S DOLLY		Ht. Above Rail	Weight
Length 36 in.	Width 14 in.	6 in.	60 lbs.

## NOLAN TOOL AND SUPPLY CAR



2000 lbs. capacity. All-tubular high-carbon steel construction for safe carrying of ties, rails, supplies, etc. Car breaks conveniently in center into two sections. Platform size 48" x 45" Ht. above rail 8" Weight 140 lbs. complete.

Write for complete railway supply catalog.

**THE NOLAN COMPANY**  
166 PENNSYLVANIA ST., BOWERS TOWN, OHIO

## Association News

### American Railway Engineering Association

Several standing committees have scheduled meetings to be held in July. These include the following:

Ties, July 15 at Atlanta, Ga., to include an inspection of the Southern Wood Preserving Company's plant, and on July 16 at Wilmington, N.C., to include an inspection of the plants of the Gulf States Creosoting Company and the Taylor-Colquitt Company; Water, Oil and Sanitation Services, July 21, AAR Research Center, Chicago; Iron and Steel Structures, July 22-23, Pick-Fort Shelby Hotel, Detroit, Mich.; Economics of Railway Labor, July 13-14, Piedmont Hotel, Atlanta, Ga.; Special Committee on Continuous Welded Rail, July 21-22, El Otero Hotel, LaJunta, Colo.

A meeting of the Board of Direction will be held on August 7 at the Sherman Hotel, Chicago.

### Roadmasters' Association

The Executive Committee of the association held a meeting at the Sheraton-Jefferson Hotel, St. Louis, on May 11. Preliminary plans for the convention to be held at the Conrad Hilton Hotel, Chicago, in September, were discussed. The committee also reviewed and approved the six committee reports to be presented at the convention by special subjects committees.

Plans for the convention were expected to be finalized at a meeting of the Executive Committee to be held at the Chicago Engineers' Club on July 6.

### Bridge & Building Association

The program for the forthcoming convention, to be held on September 15-17 at the Conrad Hilton Hotel, Chicago, was among the subjects discussed at a meeting of the Executive Committee held at Chicago on June 22. Much of the time of the meeting was devoted to the reading and review of the six reports of special subjects committees, which will be presented before the business sessions of the convention. Another important item of business on the agenda was a discussion of ways and means of increasing the membership of the association.

### Association of Track and Structure Suppliers

More than 95 per cent of the space available for the exhibit to be held at the Coliseum, Chicago, September 14-17 has been reserved, according to Lewis Thomas, director of exhibits. Commitments have been received for 265 booths from 103 manufacturers, he said.

The exhibition will be held in conjunction with the annual conventions of the Roadmasters' Association and the American Railway Bridge & Building Association.

The recent upsurge in railroad buying has



**ON THE JOB**  
... ON THE TOUGHEST JOBS

**ARCTIC BOY**

portable water coolers

... built to take a beating on construction jobs, in mines, on the farm, railroad crews, on service trucks ... wherever men work and the going is rough.

They keep drinking water cool and sanitary, keep worker efficiency up. And note these features:

- HOT DIPPED Galvanized or stainless steel insets
- Sparkleen plastic liner ... non toxic, prevents corrosion
- Large opening, easy to ice and clean
- Extra large insulation space

Send for free booklet  
"Care and Use of Your  
Cooler." Write Dept. C-54

SCHLUETER MFG. CO.



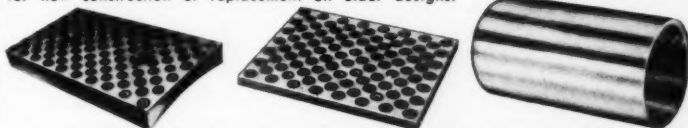
St. Louis, Mo.



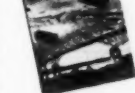
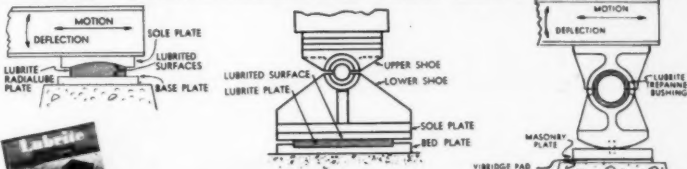
WHEN EXPANSION, CONTRACTION and/or ROTATION IS A FACTOR

## SPECIFY Lubrite Self Lubricating EXPANSION PLATES & BUSHINGS

For self lubricating security at its finest in the design of any bridge, overpass, building and as a replacement for rockers and roller nests, Lubrite offers many distinct and important advantages. Specifically Lubrite permits the use of simplified designs, cuts construction costs substantially, eliminates maintenance and offers a low coefficient of friction. Assure better results, longer life and unequalled performance — specify Lubrite for new construction or replacement on older designs.



### 3 BASIC LUBRITE ASSEMBLIES FROM MANY AVAILABLE



Send for this free 20 page Lubrite Manual No. 55 — contains complete information, technical data and specifications about Lubrite Self Lubricating Plates and Bushings.

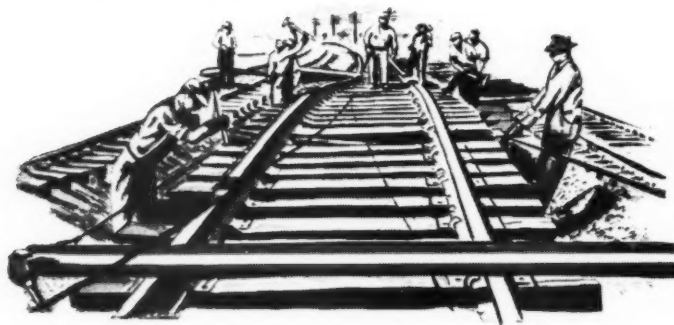


**LUBRITE DIVISION**  
**MERRIMAN BROS., INC.**  
197 Amory Street Boston 30, Mass.

# WORN TIES REMOVED



# IN SECONDS...



As it plows out old ballast the Mannix Undertrack Plow performs another service! Track behind the plow is raised about 1 foot above roadbed level. This enables dead ties to be removed in seconds. New ties can be positioned just as quickly. It's one more way in which this proven Mannix equipment is saving time and money with "maintenance-of-

... as you plow out ballast the proven

# MANNIX

way!

way the modern way" on leading railroads.



*Inquire about free showing of 16 mm. film on Mannix Plow (and Mannix Sled for raising track on new or old ballast). Ask for full details of Mannix service and special rental plan. A representative will call if you wish - no obligation.*

4020 MINNETONKA BLVD.  
MINNEAPOLIS 16, MINN.  
PHONE WALnut 7-9411



## Association news (cont'd)

prompted a number of inquiries from manufacturers regarding the remaining desirable space, stated Mr. Thomas. Interested manufacturers should contact Mr. Thomas, Room 705, 59 E. Van Buren St., Chicago 5.

## Supply Trade News

**ARMCO DRAINAGE**—J. Shelby Welch has been appointed assistant manager of railroad sales of Armco Drainage & Metal Products, Inc., with headquarters at Atlanta, Ga.

**BUCYRUS-ERIE COMPANY** — Frederick I. Shew, sales development manager, commercial cranes and excavators, has been appointed manager of sales, commercial cranes and excavators.

**THE DOW CHEMICAL COMPANY**—This company has announced that, under the terms of a recent licensing agreement, its fire retardant compound, Arban, will become a product of the Chapman Chemical Company. Arban was developed for use in oil-type wood preservative systems.

**FAIRMONT**—Owen Buscho, sales representative at San Francisco, Calif., has been transferred to St. Louis, Mo., succeeding Fred Rose, who, in turn, has been transferred to San Francisco.

**LINDE COMPANY**—Warren G. Gumm has been appointed manager engineering — Railroad department, with headquarters at Chicago, according to an announcement by K. I. Thompson, manager of the railroad department of this company which is a division of Union Carbide Corporation. Mr. Gumm will be responsible for the development of new equipment and the improvement of the company's existing railroad products.

**P. & M. CO.**—Roger B. Coleman has been appointed vice-president of this company which is a division of Poor & Co. In this capacity, Mr. Coleman will be in charge of the New York office. He was educated in the public schools of Plainfield, N. J., graduated from Blair Academy and received his higher education at Yale University. During World War II he was a pilot with the U. S. Air Force. Mr. Coleman was appointed a service representative for the



Roger B. Coleman  
P. & M. Co.



R. W. Claypool  
U.S. Steel





**J. Shelby Welch**  
Armco



**John E. Erskine**  
Racine

Chipman Chemical Company, Inc., in May 1947 and was subsequently promoted to general manager, railroad division.

#### **RACINE HYDRAULICS & MACHINERY, INC.—**

**John E. Erskine**, executive vice president, has been elected president of this company, succeeding his father **Malcolm E. Erskine** who continues as chairman of the board. **George B. Miller**, vice-president in charge of engineering, has been elected executive vice-president, succeeding Mr. Erskine. **James E. Mohrhauser**, previously responsible for manufacturing, has been elected vice-president in charge of operations.

#### **RAILWAY MAINTENANCE CORPORATION—**

This company has announced the appointment of **James M. Motley & Co., Inc.**, as its representative in Mexico and surrounding countries. The Motley organization has offices in New York and Mexico City.

#### **REPUBLIC CREOSOTING COMPANY —**

**Carlton B. Edwards** has been elected to the newly-created position of chairman of the board of directors of this company and its subsidiary, **Reilly Tar & Chemical Corp.**, both with headquarters at Indianapolis, Ind. **Peter C. Reilly** has been elected president of the two companies and **Thomas E. Reilly**, vice-president, will serve also as treasurer.

**SPERRY PRODUCTS, INC.—****Henry T. Lowell, Jr.**, has been appointed sales manager for this company. He will direct all sales activities for railroad services, ultrasonics and other manufactured products.

**UNITED STATES STEEL CORP. —****Robert S. Whiteside**, assistant to manager—railroad materials sales, has been promoted to assistant manager of the Railroad Products section, succeeding **Richard W. Claypoole**, who has been advanced to manager of the Railroad Products section, according to an announcement by **M. M. Chapman**, vice-president—sales. Mr. Claypoole succeeds **Samuel McClements, Jr.**, who has retired after 40 years of service.



**Carlton B. Edwards**  
Republic Creosoting



**Peter C. Reilly**  
Republic Creosoting

RAILWAY TRACK and STRUCTURES

## RED SEAL RUGGEDNESS

## AND RIGHTNESS OF DESIGN

are helping to build product acceptance  
for leading builders of  
**SPECIALIZED EQUIPMENT**



**Ingersoll-Rand compressor operating paving breaker.  
Power: Continental.**

In design, in materials, and in lasting performance, Continental Red Seal engines give you the benefit of 57 years' aggressive engineering. Traditional Red Seal ruggedness finds its natural reflection in rock-bottom upkeep costs. You find Continental-powered equipment on the job—wherever there's a job to be done—in excavating, ditching, concrete ripping, railway building and maintenance, and all phases of road construction. Every Continental Red Seal is not only built for the job, but backed by parts and service facilities the world over.



**Continental Motors Corporation**

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ST. THOMAS, ONTARIO



DISMANTLED  
Frame—steel tubing.

Deck—4' x 5' weatherproof  
plywood and corrugated  
steel construction.

Weights only 160 lbs.—yet will carry a thousand pounds of tools or materials! This is due to the novel steel-reinforced weather-proof plywood deck construction. *Light—but amazingly strong!* Can be set up or dismantled in less than a minute for easy loading into a truck, bus or motor car.

SEND FOR BULLETIN # 186

CONSERVE THE ENERGY  
OF YOUR MOBILE TRACK  
GANGS WITH THIS . . .

## WOOLERY

### TRACK TOOL TRANSPORTER

This handy, light-weight push car carries tools to the job site from the nearest crossing or other point where truck or bus must stop. Men arrive fresh and ready for work having been spared the laborious job of toting hundreds of pounds of tools and equipment—saves time—and muscles—for the important job!

Rolls easily on anti-friction bearings even when fully loaded.

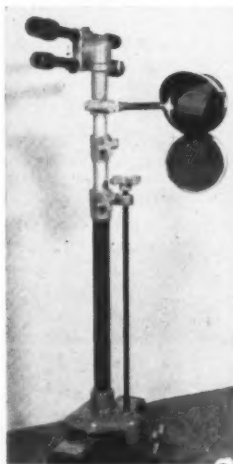
Handle can be inserted on either side for pushing in either direction.

**WOOLERY MACHINE CO.** 2919 Como Ave., S.E., Minneapolis 14, Minn.



*Accurate, rugged,  
and foolproof . . .*

### The New Model HL Track Lining Scope



The top telescope looks forward—the lower one, factory-set in precise parallel, looks backward. Vertical cross-hair in each cuts gauge edge of rail when telescopes are tilted. There is no way to go wrong after Model HL is leveled (with the convenient knee-high control).

Tough, heat-treated cast aluminum construction; weight 9 lbs. Twin 6-power achromatic telescopes, adjustable for individual vision. Raises to 5' 4" high on 6" rail. Sturdy Carrying Case furnished. Write for Circular No. 111.

**The BRICE HAYES Co.,**  
6710 Northwest Highway,  
Chicago 31, Illinois

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of every mile of track...

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**THE SUPER POWERED  
SPRING LOCK WASHERS**

—with reserve power that  
holds rails and joints

**TIGHTER, LONGER!**



*Improved Hipowers* maintain constant bolt tension, keep bolts tight, absorb shocks, protect rail ends. These super-powered railway spring washers withstand the terrific stresses and strains, and the constant pounding of main line traffic. Reduce maintenance costs by installing National Spring Washers.

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**The NATIONAL LOCK WASHER COMPANY**

*Serving Industry Since 1886 — NEWARK 5, NEW JERSEY, U.S.A.*

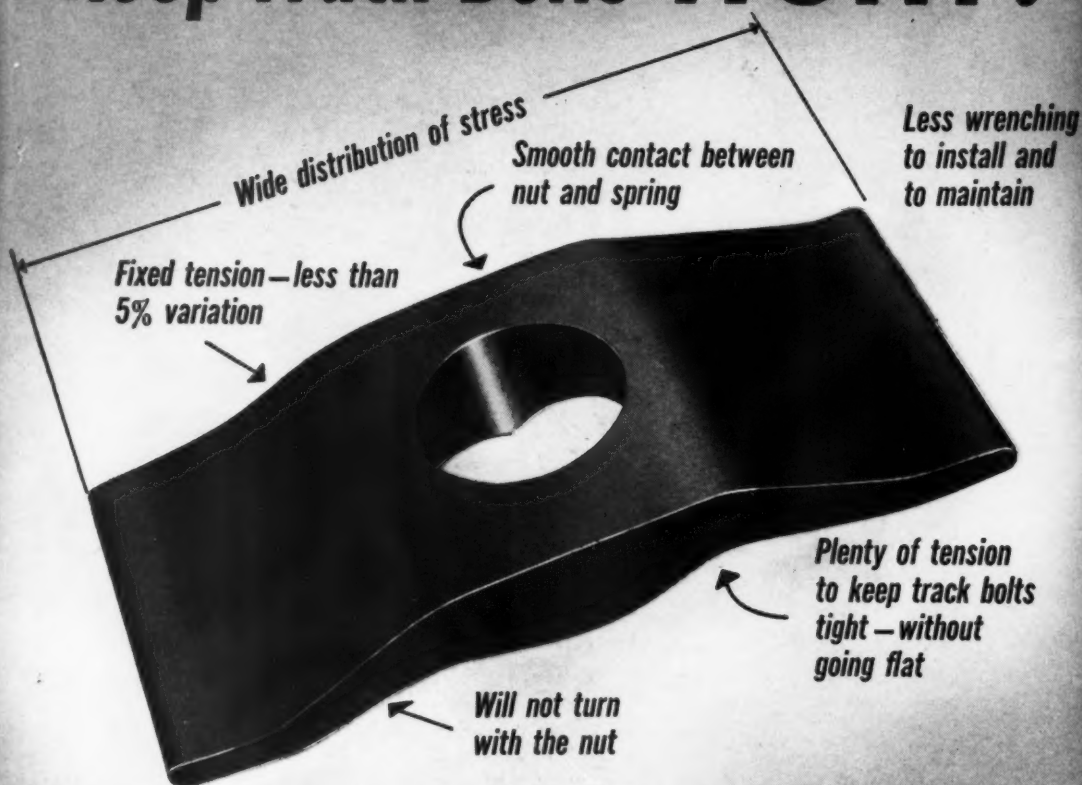


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**FIXED TENSION  
TRIFLEX**

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prevents track buckling and pull-apart

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